DOCUMENT RESUME

ED 257 341 HE 018 370

AUTHOR	Avakov, R., Ed.; And Others
TITLE	Higher Education and Employment in the USSR and in the Federal Republic of Germany.
INSTITUTION	United Nations Educational, Scientific, and Cultural Organization, Paris (France). International Inst. for Educational Planning.
REPORT NO	ISBN-92-803-1115-8
PUB DATE	84
NOTE	341p.
AVAILABLE FROM	United Nations Educational, Scientific, and Cultural Organization, 7 Place de Fontenoy, 75700 Paris, France.
PUB TYPE	Reports - Descriptive (141) -- Books (010)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Access to Education; College Graduates; *College Planning: *Comparative Education; Curriculum Development; *Education Work Relationship; Employment Projections; Foreign Countries; *Higher Education; Industrialization; *Labor Market; Technological Advancement; Unemployment
IDENTIFIERS	*USSR; *West Germany

ABSTRACT

Results of two studies on higher education and employment in the USSR and the Federal Republic of Germany (West Germany) are presented. For both countries, the development of the higher education system as part of the overall system of education is discussed, with emphasis on expansion of higher education, and access to college over the years. Attention is also directed to: development of graduate employment, outside influences on curriculum development, and labor markets for college graduates. The section on the USSR, by D. Chuprunov, R. Avakov, and E. Jiltsov, covers (1) the evolution of the problem of high-level personnel in the process of industrialization as socialism was built and advanced and (2) the role of higher education in scientific and technological development. Chapter topics and authors for the West German section are: higher education and the labor market in West Germany (U. Teichler, B. C. Sanyal); recent developments in higher education (Klaus Hufnerder); labor market and educational forecasts (Manfred Tessaring); underemployment of college graduates (Dirk Hartung); and certificates and recruitment (Michael Buttgereit). A comparison of higher education, employment, and educational planning in the two countries is provided by M. Buttgereit. (SW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED257341

Higher education and employment in the USSR and in the Federal Republic of Germany

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.

- Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL IN **MICROFICHE ONLY** HAS BEEN GRANTED BY
UNESCO

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Higher education and employment in the USSR and in the Federal Republic of Germany

Edited by

R. Avakov B.C. Sanyal

M. Buttgereit U. Teichler

Paris 1984

Unesco: International Institute for Educational Planning

The ideas and opinions expressed in this book are those of the
authors and do not necessarily represent the views of Unesco

Published in 1984 by the United Nations
Educational, Scientific and Cultural Organization
7, Place de Fontenoy, 75700 Paris

Composition and page make-up by
the International Institute for Educational Planning
7-9, rue Eugène-Delacroix, 75116 Paris
Printed in the Federal Republic of Germany by
the Comprehensive University of Kassel

ISBN 92-803-1115-8

© Unesco 1984

Preface

This comparative study on Higher Education and Employment in the USSR and the Federal Republic of Germany is the result of two research projects undertaken by the IIEP during its last Medium-Term Plan (1979-83). One of the projects, under the direction of Bikas C. Sanyal, dealt with the problem of higher education and employment in selected countries around the world; the other, under the direction of R.M. Avakov, dealt with the problem of technological and industrial development and its implications for employment and education.

These studies, as well as other activities in the research programme of the IIEP, reflect the increasing concern in educational planning to relate the world of education more closely with the world of work. It is hoped that the results of such studies may represent a constructive contribution towards policy formulation for education and employment, as well as provide useful methodological insights for investigating similar problems in other countries.

Both the Federal Republic of Germany and the USSR are facing problems of utilization of higher education graduates in the employment market today. In order to correct the situation, both countries are attempting by various means to adjust their systems of higher education. Given the differences in their socio-economic context, it is obviously interesting to identify the differences as well as the common characteristics of the adjustment processes.

The centrally planned economy of the USSR, has a built-in mechanism for relating educational output with the absorptive capacity of the labour market. Yet, this matching process, in practice, gives rise to problems not always entirely solved. With its market economy, it could have been surmised that the Federal Republic of Germany could have left such adjustment to come about through the natural forces of the market. Yet, it can be noted that significant efforts are being made from outside these market forces to secure a more harmonious relation between education and employment.

These are indications that the task of educational planning today is becoming increasingly complex. It calls for efforts to outreach the development and application of oversimplified models of quantitative correspondence between the output of an education system and the hypothetical needs of the labour market. The summarized versions of the studies on the USSR and Federal Republic of Germany included in this book, as well as the comparative analysis of the situation in the two countries, demonstrate the difficulty, and possibly the usefulness, of predicting with much accuracy the actual absorptive capacity of the labour market.

The two country case studies were critically reviewed at an international Workshop, organized in Kassel, Federal Republic of Germany, in January 1983. We are grateful to the participants in the Workshop, whose comments have proved extremely useful in preparing this volume.

It is hoped that the research presented here will add substantially to the knowledge-base on education and employment for both market and centrally planned economies in both developed and developing countries.

Financial support for this study has been provided to IIEP by the Ministry for Economic Co-operation (BMZ) of the Federal Republic of Germany, and this is acknowledged with gratitude.

Sylvain Lourié
Director, IIEP

Contents

Introduction
by R. Avakov, B.C. Sanyal and U. Teichler 9

Part I. Higher education, employment and technological progress in the USSR
by D. Chuprunov, R. Avakov, E. Jiltsov 17

Part II. Higher education and employment in the Federal Republic of Germany 87

Chapter 1. Higher education and the labour market
by U. Teichler and B.C. Sanyal 89

Chapter 2. Recent developments in higher education
- A. Higher education in the Federal Republic of Germany: a planned or market system? Or a third way?
  by Klaus Hüfner 185
- B. Labour market and educational forecasts in the Federal Republic of Germany
  by Manfred Tessaring 197
- C. Some manifestations and implications of underemployment of college graduates: the case of the Federal Republic of Germany
  by Dirk Hartung 212
- D. Certificates and recruitment
  by Michael Buttgereit 217

Part III. Higher education and its relations to employment in the USSR and in the Federal Republic of Germany - a comparison
by Michael Buttgereit 231

Conclusions
by R. Avakov, B.C. Sanyal and U. Teichler 327

Contributors

R. AVAKOV, staff member of the IIEP responsible for the research project on "Education and Development".

Michel BUTTGEREIT, staff member of the Centre for Research on Higher Education and Work at the Comprehensive University of Kassel.

Dmitrij CHUPRUNOV, Director, Ministry of Higher and Secondary Specialized Education in the USSR.

Dirk HARTUNG, staff member of the Max-Planck Institute for Educational Research, Berlin.

Klaus HÜFNER, Professor at the Free University of Berlin.

E. JILTSOV, Director of the Laboratory of Economics of Education at the Moscow State University.

Bikas C. SANYAL, staff member of the IIEP responsible for the research project on "Higher Education and Employment".

Ulrich TEICHLER, Director of the Centre for Research on Higher Education and Work at the Comprehensive University of Kassel.

Manfred TESSARING, staff member of the Institute for Labour Market and Occupational Research, Nuremberg.

* * *

The authors wish to acknowledge the co-operation received from UNESCO and the IIEP, the Comprehensive University of Kassel and the Centre for Research in Higher Education and Work, Kassel, the German Unesco Commission, Bonn, the Ministry for Higher and Secondary Specialized Education of the USSR, and Moscow University.

We also wish to express our appreciation for their support and assistance in the organization of the Workshop in Kassel to the following: the Municipality of Kassel and the Land of Hessen, the Daimler Benz Company, Helga Cassidy, Gabriele Gorzka and Yoko Teichler.

Finally, we are grateful to Kay Brownrigg, the IIEP project secretary, for assisting in the editorial work of this volume.

Introduction

by R. Avakov, B.C. Sanyal and U. Teichler

1. The rationale of the study

During the last three decades higher education has expanded rapidly all over the world due to various reasons, one of which is economic. In the sixties and seventies, investment in human beings was considered to be a powerful factor for economic progress. In market economies, the rates of return - perhaps in a very approximate and sometimes arbitrary fashion - have shown that such return on educational opportunities is at least as high as investments in other directions. Again, many countries with a market economy faced shortage of high level manpower during this period. Planning models implicitly assumed that one of the principal educational planning problems was to supply the economy as rapidly as possible with educated manpower, necessary to eliminate human resource "bottlenecks" in expanding sectors. Industrial development received more attention than agricultural development because of the concentration of skilled labour in industry, the idea being that only dynamic industrial growth could absorb the underemployed in rural areas and lead economies into "take off". The sustained economic growth that could be achieved through industrialization was expected to improve the overall economic condition of the people through improved consumption patterns in the long run. Emphasis was therefore laid on the development of higher education so that the output could meet the immediate requirements.

Another reason for expansion was social and cultural. The view that education is a fundamental human right gave rise to the idea of democratization in the provision of educational opportunities to all sectors of the society. Various means were adopted to achieve equity, including financial incentives, regionalization of higher education and the introduction of non-traditional forms of higher education. The fact that higher education increases the social status of an individual also increases individual demand for higher education. Moreover, education provides human beings with a variety of experiences on which to base their values and outlook on life. This adds a cultural dimension to the goals of higher education. Some countries - particularly industrialized ones and those that were economically better off - made a point of providing higher education for the largest possible number of people in order to accomplish the society's social and cultural aims.

There were also political reasons for the expansion in higher education. In all countries, and for all the regions within a country, an institution of higher education is a symbol of national and regional prestige. This created additional demand for new institutions of higher education.

The rapid expansion of higher education has created as many problems as it has solved. One of the main problems is the difficulty for the economy to absorb high level manpower to the extent supplied. The problem became more acute in the seventies when the economic recession started throughout the world and revealed itself in the problem of unemployment and reduced productivity through underutilization or underemployment of graduates.

At about the same time technological progress accelerated, replacing human workforce by machines in the industrialized countries. Some scenarios describe the impact of technological advancement in a way that would suppress entire occupations and significantly change means of production and the lifestyles of people in the next few decades.

During the same period, to meet the increased expectations in lifestyle and the objectives of democratization, participation rate in the labour force has also increased substantially, contributing to the problem of employment of graduates. This has been particularly true for female graduates. Demographic reasons have also contributed to unemployment in particular professions. For example, reduction in the school-age population in some industrialized countries has reduced the demand for teachers, at least temporarily.

The problem of employment of higher education graduates has been drawing the attention of researchers to an increased extent in recent years. However, research has been based on different assumptions. In one extreme, it has been assumed that the requirement of skills for the development of the economy can be supplied by the education system through manpower forecasts and planned admission policies for higher education. In the other extreme, it is maintained that education is not a determinant of productivity; people are matched to jobs by criteria which may be associated to education, but in reality this association is only artificial. The actual relationship may be somewhere in between, where socio-psychological variables may also play an important rôle. The relationship between higher education and employment thus becomes a complex one and calls for in-depth analysis and understanding to develop possible remedies for the development of higher education to be matched with the needs of the society in general and employment needs in particular.

It is in this context that the International Institute for Educational Planning of Unesco launched two research projects during the seventies: one dealing with the adjustment problems between higher education and employment, where macro aspects of the society - namely, the operation of the economy, the labour market and the education system - were combined with the micro characteristics (e.g., socio-psychological variables) of students, graduates and employers; and another project dealing with the problem of technological and industrial development and its implications for employment and education. Although the research dealt mainly with the problems of developing countries, it was considered that the experiences of industrialized countries in adjusting the development of higher education with employment could provide a useful knowledge-base for the developing countries. Therefore, case studies were launched in a few selected industrialized countries to look critically into the problem, the methods adopted and the results achieved.

In this volume, we summarize the results of two research studies undertaken by the IIEP within the framework of the two research projects: one study on the USSR[1] and the other on the Federal Republic of Germany.[2]

2. Rationale of the choice of the countries

The two countries belong to two different economic systems. The USSR, a centrally planned economy, practises educational planning as an integral part of the socio-economic planning of the country. The Federal Republic of Germany has a market economy; educational planning is practised only in a fragmented way and institutional planning dominates the scene, particularly when problems of resource allocation and utilization are confronted. Differences in the market and social structures in the two countries result in a different relationship between higher education and employment. The characteristics of these differences can provide useful knowledge for improving the planning mechanism not only in the countries studied but also for other countries. These differences may be more noticeable, in these two countries, making the analysis of the implications for planning easier.

Knowledge about these differences in the approach and their impact on the quality of life, in this case the employment situation, provides the basis for scientific co-operation between the two countries with different ideologies for socio-economic development. This kind of venture, when undertaken jointly as in the present case, opens up possibilities for co-operation beyond the scientific domain to economic co-operation as well. The two countries also have a great many similarities, particularly in their systems of higher education. Both countries have two distinct types of higher education. Also, the two countries are going through technological progress to an extent where the higher education system is attempting to adapt to this change on the one hand, and on the other the impact of this technological progress is being observed in the employment situation.

---

[1] D. Chuprunov, R. Avakov, E. Jiltsov, Enseignement supérieur, emploi et progrès technique en URSS, Unesco Press/IIEP, Paris, 1982.

[2] U. Teichler, B.C. Sanyal, Higher Education and the Labour Market in the Federal Republic of Germany, Unesco Press/IIEP, Paris, 1982.

Both the Federal Republic of Germany and the USSR are facing the problem of utilization of higher education graduates in the employment market, the former facing also the problem of unemployment of college graduates. In order to improve upon the situation, both countries are attempting to adjust their systems of higher education by various means. In this respect, the interest in the planning exercise in the Federal Republic of Germany is worth noting given its market economy.

These are some of the similarities that made us choose these two countries for a comparative analysis of their methods of relating higher education to employment. There are also points of difference which made us undertake such a comparison, as follows:

The multinational nature of the USSR society makes it a more difficult task to achieve balanced development of the whole country - the system of central planning with educational planning as an integral part is perhaps a natural choice; on the other hand, the heterogeneity among the different "Länder" of the Federal Republic of Germany is much less and allows the decentralized decision-making work.

The emphasis on equality of social classes is a national policy in the USSR; in the Federal Republic of Germany, more emphasis is put on individual initiative.

Given the present economic stagnation and the general demographic set-up, the market economy of the Federal Republic of Germany does not allow for full employment of higher education graduates; under these conditions, the bargaining position of graduates regarding wages and working conditions is weakened, although collective bargaining resists this. In the USSR, every citizen is guaranteed an employment, although the recent economic situation has generated fewer productive jobs for the economy, running the risk of underproductivity through misallocation of graduates and underutilization of qualified manpower.

In the Federal Republic of Germany, education traditionally "sorted" children primarily into economic and social rôles related to their parents' socio-economic background. The expansion of education, which helped to produce higher levels of skills in the society even though these skills cannot be fully employed, was instrumental in reducing inequality of education to some extent.

In the USSR, education serves socialist development strategies which in their turn shape the education system. The principle of abolition of class division and elimination of income and status difference between various kinds of work provides in the education system the possibility for substantial social mobility. Nevertheless, because the total elimination of the class structure is not only dependent on the political philosophy of socialism, but on attitudes, customs and beliefs of individuals and communities, achievement in this area may not be total in certain cases. In fact, there may exist important differences between different kinds of workers. Formal education may still "sort" the children of peasants, workers and intelligentsia into different kinds and levels of education. Also, the "sorting" function of schools, as well as the need for highly skilled manpower in the USSR, is likely to put emphasis on individual performance.

The different socio-economic factors, the different ideologies in respect of development strategies and in the development of the education system, and their interest in the relationship between the development of higher education with the employment needs of the society, made us select these two countries for a deeper analysis of the approaches followed by them in articulating this relationship and in particular to achieve the objectives of this report as mentioned in the following section.

3. The objectives of this volume

The principal objective of the present volume is to draw some lessons from the experience of the two industrialized countries belonging to two different socio-economic systems in relating higher education with employment so as to enrich the knowledge-base for planning of higher education. The specific objectives were:

(1) to trace the past developments of higher education in structure, content and quantity, and their relationship with the changes in the employment structure of the economy of the two countries;

(2) to trace the rôle of planning in relating higher education with employment given the technological changes, the changes in expectations and attitudes of the people, as well as economic changes in the respective countries;

(3) to throw light on the current policies of higher education and employment given the economic recession on the one hand and technological advancement on the other in recent years which resulted in some basic changes in the relationship between higher education and employment in the two countries;

(4) to reflect on the evolution in the concept of planning of higher education in the two countries given the complexities

of the world of work, and the world of work;
and finally, in an indirect way,

(5) to stress the need for scientific and academic co-operation which may lead to increased understanding among countries with different ideological background and increased co-operation in other areas.

4. The organization of the work

The above objectives led the authors to diagnose analytically the evolution of the relationship between higher education and employment in the USSR and the Federal Republic of Germany, as well as the problem confronted in changing this relationship.
The International Insitute for Educational Planning of Unesco and the Research Institute for Higher Education and Work, in Kassel, Federal Republic of Germany, jointly organized a review workshop with the participation of the authors of the two country case studies and a number of experts of international repute from centrally planned economies and market economies. The workshop took place in Kassel in January 1983. The purpose of the workshop was to discuss the two studies on the USSR and the Federal Republic of Germany emphasizing the following topics:

(1) the ways of regulating the system of higher education;
(2) the objectives of higher education policy and planning, in particular the problems of harmony or conflict in these objectives;
(3) the ways of perceiving and tackling the area of higher education and employment in the two countries.

Although the original idea was to make a comparative analysis, the discussions at the workshop revealed a number of commonalities in the problems and also in the approach. It was therefore felt that a comparative analysis would allow one country or system to learn from the experiences of success or failure of another. It was also noted that a comparative analysis could allow a classification of different educational and employment phenomena to be undertaken by researchers. Finally, it was considered that since experimentation in a strict sense is not possible in the educational sciences, comparison of one system with another might provide explanations for certain phenomena of interest. Consequently, a comparative analysis has been incorporated into the present volume, based on the discussions at the workshop as well as the findings of the two studies, and touches on the following topics:

(1) development of the system of higher education as part of the overall system of education, emphasizing on:
    - expansion of higher education, and
    - norms and achievements in access to higher education over the years;

(2) education and employment, emphasizing on:
  - development of graduate employment,
  - the rôle of actors external to higher education in the revision of curricula,
  - labour markets for graduates of higher education, and
  - the place of highly qualified manpower in the division of labour;

(3) procedures of planning, emphasizing on:
  - the scope of planning, and
  - changes in the planning mechanism.

5. The structure of the book

The book has three parts: Part I describes the case of the USSR and discusses the evolution of the problem of high level manpower in the process of industrialization during the phase of the building of socialism and during the creation of the advanced socialist society. In the latter phase, the rôle of education in strengthening the quality of specialists in implementing the model of intensive development of the economy has been emphasized. This is followed by an analytical treatment of the role of higher education in the scientific and technological development of the country. First this has dealt with the changes in the structures, content and methods of higher education (admission policy, quality of instruction and interdependence between teaching and research in particular). Next, the relationship between higher education and production has been analysed, including the rôle of the enterprise in education and training, the rôle of planning in the placement of graduates, the rôle of career guidance and lifelong education in making higher education better related to productive sectors of the economy. Finally, the experience and evolution of the planning mechanism of higher education in meeting the intensive development needs of the economy has been discussed with special emphasis on the employment needs for specialists. In conclusion, the authors offer suggestions for improving upon the mechanism of higher education planning in the USSR in order to bring it closer to the world of work.

Part II of the book deals with the case of the Federal Republic of Germany. A description of the development of the economy, education and the problem of unemployment of graduates is followed by an analysis of the characteristics of the development of higher education and its relationship with employment. There follows an historical discussion on the changing issues of the political debate on the subject, a description of the research scene with special emphasis on the rôle of manpower forecasts, and a discussion on the qualitative relationship between higher education and work where the content and methods of education are related with the skill needs of jobs. The first chapter ends with a discussion on the changing relationship between higher education and employment in the face of an excess supply of graduates in recent years.

There follow contributions on some specific areas of recent development in the relationship between higher education and employment. These include the experience of the Federal Republic of Germany in the use of manpower forecasts in the planning of higher education, the problem of unemployment and underemployment of graduates, the rôle of diplomas in the recruitment process, and finally an explanation of the recent debates on and approaches followed by the universities in the Federal Republic of Germany in the face of the unemployment problem on the one hand and the financial crisis on the other.

Part III deals with the comparative analysis in the relationship between higher education and employment in the two countries following the topics mentioned before.

The concluding section of the book provides the synthesis of the findings of the two country studies and the comparative analysis in an attempt to meet the objectives set out above.

6. Limitations of the study

It has been mentioned earlier that the idea of a comparative analysis was absent when formulating the conceptual framework of the two case studies. The two studies were completed at different points of time; the study on the Federal Republic of Germany in 1979 and the study on the USSR in 1981. This gap has however been bridged by updating the information in both cases and also adding separate contributions in specific areas on the more recent situation. However, considerable gaps still exist in national statistics in covering the different aspects of a comparative analysis. Even so, the authors consider that the present volume will be useful for researchers, planners and decision-makers not only in the USSR and the Federal Republic of Germany, but in other developed and developing countries as well, given the experience of success and failure in these two countries in their efforts to relate higher education more closely with employment - an area of crucial international importance today.

Part I. Higher education, employment and technological progress in the USSR

by D. Chuprunov, R. Avakov, E. Jiltsov

CONTENTS

1. Introduction 19

2. The socio-economic context of educational development 26

3. Structures, methods and content of higher education 33

4. Higher education and production 49

5. Intensive development of the economy and higher educational planning 64

6. Conclusions 78

1. INTRODUCTION

As has been mentioned in the Introductory Chapter, within the framework of its Medium-Term Plan for 1978-83, the International Institute for Educational Planning (IIEP-UNESCO) has developed two research projects: one on education and development, and the other on higher education and employment of graduates.

In the IIEP's programme, particular attention is given to the developing countries, where the problem is of considerable importance at the present stage of their historical evolution. However, the programme covers other countries and in particular the socialist countries, whose experience is of immense help in studying this problem.

A study of the relationship between education, employment and industrialization, as well as scientific and technological progress, reveals considerable shortcomings. The problem has not been adequately studied and our knowledge is limited by the mismatch of some of its aspects. Many questions remain unanswered. For example: what problems can industrial and technological development solve for education ? What are the obstacles in the field of education and training of high-level personnel ? What is planning's place in the solution of such complex problems ? To put it more positively: how can maximum attention be paid to the requirements of rapid scientific and technological progress, and consequently of employment, in the planning of education and training of high-level manpower ? How can these two phenomena be combined, in a single planning model, each having its own often opposing aims, its peculiarities and its own laws of development?

The present work, is devoted to a study of the problems involved in higher education, employment and technological progress, based on the example of the Soviet Union. The experience of the USSR provides researchers with a very wide range of material.

In the first place, the problem must be viewed against the background of a socialist society and a socialist economic system. The authors' basic idea is that the study of social phenomena - and the relations between education and development are indeed of a social nature - can only be conducted satisfactorily with this in view.

The Soviet Union is a developed socialist country, which means:

- that the soviets of people's deputies, as the organs of Soviet state power, represent the political base. The core of the political system, its vanguard and the directing force in society, is the Communist Party of the Soviet Union.
- The economic base of the Soviet state is common socialist ownership of the means of production, mainly in the forms of state ownership and co-operative and kolkhozian ownership. This provides the possibility of developing the nation's economy on a planned basis.

This type of social, political and economic system governs the content of education, its philosophy, its aims and its development perspectives. It affects also industrialization, its forms and methods, as well as scientific and technological progress. It is here that we must look for links between the different problems to be studied.

Secondly, as the study is based on the experience of a multi-national state, with more than a hundred nations and nationalities, this gives a vast choice of possibilities to determine how a particular problem is experienced against different national and cultural backgrounds, to compare the results obtained in such diverse situations, and to find ways of using such varied experience in solving the different problems involved.

In this respect, it is essential to point out an important contemporary aspect of the Soviet experience concerning the preparation and implementation of a number of measures, which followed the Great October Revolution in 1917,designed to overcome the economic and cultural backwardness and inequalities in the former Colonial territories of Tsarist Russia.

It is especially remarkable that it was the Russian people themselves who made possible the tremendous "take-off" of the economy, the rapid cultural and educational development, the setting-up of a network of higher educational establishments, and the training of highly qualified personnel in these regions. Thus it was the October Revolution which opened up immense possibilities for establishing relations of equality with the former colonies.

Thirdly, the study covers an experience which enabled the country to find fundamental solutions to the manifold problems which arose after the abolition of the Tsarist régime, and the victory of the Socialist Revolution. In other words, in every field of human activity new approaches, new methods and new models were required. The whole development philosophy of this huge country, after the October Revolution, was based on

Marxist-Leninist doctrine which, for the first time in history, was put into practice. In comparison with the West, the country was seriously backward in its economic, scientific and technological development, but, thanks to he Revolution, was soon able to catch up. New post-revolutionary ways of resolving the problems of the transition from capitalism to socialism had to be found as a new route for social progress. Solutions were indeed found, and spectacular results obtained in the struggle against enormous difficulties and obstacles, against foreign intervention and multiple aggressions. It must never be forgotten that the creation of an independant economy and a new system of education and culture took place without foreign help of any kind.

Fourthly, we are dealing with the experience of a country which managed to solve the key problems of development, particularly in the fields of culture and education, in a remarkably short space of time. In a word, the Soviet Union, having successfully accomplished the first stage of its development which resulted in the construction of a socialist society, passed on during the years 1960 and 1970 to the second stage - that of developed socialism. Thus, this experience enables a study to be made, step by step, of the harmonious development of higher education taking into account economic, scientific and technological progress over a long historical period, and to understand its vitality, and the logical sequence of the solutions found. It also reveals new elements and new trends at every stage.

The various special features noted during the Soviet experience have helped to define the structure and the aims of this study.

The author's method was to study the relationship between economic, scientific and technological progress and the dynamic development of higher education, the ways in which the problems encountered were handled, and how the difficulties and obstacles were overcome. This short English version[1] is entirely devoted to the contemporary phase - that of developed socialism.

The first stage of the Soviet experience covers nearly half a century of socialist construction. This period was full of significant events of unique, historical importance: the victory of the October Revolution, the defeat of foreign invading forces and the interior counter-revolution, the victory over fascism during the Great National War of 1941-1945, the post-war construction of the national economy and the creation of a developed economy and the creation of a developed socialist society. During this period, the following objectives were realized in the USSR:

---

[1] For French version see: R. Avakov, D. Chuprunov, E. Jiltsov, Enseignement supérieur, emploi et progrès technique en URSS Paris, 1982, Les Presses de l'Unesco, IIPE.

- The ways and means by which the Soviet state tackled the problems related to the creation and development of a new socialist system of national education, particularly of higher education, in liaison with a new socialist structure to show the main orientations in the development of industrialization and the modernisation of agriculture at the beginning of the collectivization period and the first steps in the planning of the national economy. On the other hand, it was necessary to show the specific ways in which the newly formed educational system particip[illegible] in the process of transforming a country, once technicall[illegible] economically backward, into a strong industrial power. This included describing in particular the efforts made to train specialists for industry and agriculture, based on the programme for the eradication of illiteracy. These efforts are directed towards the creation of a vast network of higher educational establishments, the opening of schools for the rapid training of young workers and kolkhozians, not having received a secondary education, to enable them to pass the entrance examinations to higher education, and the development of a network of specialized secondary schools, as well as organization of education in higher educational establishments (VUZ) and Technicum, without interruption of the working life.

- Elimination of the severe backwardness, social and economic, scientific and cultural, of the peoples of the national repub[illegible] of the Soviet Union, both by means of their involvement in the industrial process and the socialist transformation of agriculture, and through their participation in the cultural revolution. This was done first by the stamping out of illiteracy and then by training specialized national personnel, with the help of the Russian people themselves, who played an enormous part in these efforts.

- The post-war efforts of the Soviet people in the development of national education, which led to the creation of a unified system of education. This ensured a constant rise in the general educational level of the population. Special post-war characteristic features in the evolution of the system, were: (i) emphasis on the strengthening of links between school and life, (ii) manifold types of education through work, (iii) on-the-job training of qualified workers and specialists, and

(iv) a policy aiming at the intensifying of links between higher education and production, etc.

The second stage of Soviet experience, which is the object of study of the English version, covers approximately two decades. This contemporary period of development in the Soviet Union and of its educational system and training of higher level manpower, is the principal subject of this study.

The authors took as their starting point the concept that at present a new factor affects the relationship between education and development, the advent of the scientific and technological revolution which is giving fresh momentum to industry, changing its products, its procedures and its objectives. The method of comparative analysis used in this study, aims to bring out the new features as well as the continuity in the evolution of the Soviet experience. To demonstrate these two aspects, the authors have focussed their attention on the following points:

- Theory and practice in the intensification of the national economy, and changes related to the problem of high level manpower, from both the quantitative and qualitative aspects. In analysing these questions, the authors have tried to show, on the one hand, the dynamic development of the Soviet economy at the present moment, its achievements and those problems which are still to be resolved. An attempt was made to reveal the reasons conditioning the inevitable trend aiming first of all at limiting, and then progressively overtaking, the extensive factors of the development of the Soviet economy, assuring its transition to the phase of intensive development. The authors have tried to show the growing importance of such factors as the modification of the geographical exploitation of natural resources (their concentration in regions not easily accessible, sparsely populated, and with poor climatic conditions), changes in the geological and mining conditions for extracting these resources, worsening of the problem of manpower as one of the remote demographic consequences of the War, etc.

On the other hand, it was essential also to study changes concerning the second "partner" in these new conditions - the system of higher education and the training of high level personnel. To this end, questions were posed concerning: the mobility of qualified manpower, especially in the category of specialists having completed higher education; the difficulties and problems as to the sources of high level personnel for the national economy, science and culture; the strengthening of the role of specialists in the process of transition of the economy towards intensive development.

- Characteristics of the model of development of the system of higher education and the training of high level manpower. The authors attempted to study the evolution of the system, by following the progress of selected young people during their vocational guidance before entering higher educational establishments, throughout the period of instruction, to the start of their professional career in the enterprise. Throughout, particular attention was paid to the qualitative questions, such as the type of specialist with broad qualifications, revision of the list of occupations and specializations in the light of the scientific and technological revolution, improvements in the contents of training programmes and curricula, increase the number of students taking part in scientific research during their studies, etc.

- Evolution of planning methods for the development of higher education, taking more widely into account the demands for scientific and technological progress. The authors' attention in this part of the study has focussed on the following two aspects: first, methods used today by Soviet planning organizations to determine needs for specialists, the central and most complex problem of higher educational planning. Secondly, the efforts of Soviet scholars and specialists to perfect the planning of higher education and the training of specialists.

The documents and statistical material used in the study may be divided into four groups:

(1) Official documents - resolutions of the Congress of the CPSU and of the Council of Ministers in which are set out the principal objectives of the strategy and policy of the Soviet Union, in particular in the field of education and the training of high level personnel.

The first documents dealing with questions of education and the training of specialized personnel adopted by the directing organs of the young Soviet State were particularly important for the present study. For the contemporary period, materials from the 24th, 25th and 26th Congresses of the CPSU were used. Mention must be made of an important document adopted by the 26th Congress of the CPSU, entitled: "Guidelines for the economic and social development of the USSR for 1981-1985 and for the period up to in 1990", which serves as a basis for understanding the fundamental questions of development in the USSR during the 1980s. We should also mention the Collection of documents on "National education in the USSR (1917-1973)" which bring together the principal official documents dealing with the development of the Soviet educational system (Moscow, Ed. Pedagogy, 1974). This includes, among others, "Legislative Principles of the USSR and the Soviet Republics for National Education".

(2) Materials of a methodological nature for the drawing up of plans and questionnaires destined for special surveys, for example: "Methodological directives for the elaboration of a State plan for the development of the national economy".

(3) Official statistics: "National economy in the USSR" (Statistical Collection), "National Education, science and culture in the USSR", "Census breakdown of the national

population in 1970 and 1979", "Work in the Soviet Union", "Women and Children in the USSR", amongst others.

(4) Finally, the official statistics are complemented by the results of certain surveys carried out by the authors.

2. THE SOCIO-ECONOMIC CONTEXT OF EDUCATIONAL DEVELOPMENT

During the late 1960s and the early 1970s, the Soviet Union entered the contemporary phase of its historical development, with socialism advancing on its own basis, equipped with powerful forces of production, advanced science and culture, and huge economic, scientific and technological potential. What tends to predominate in this new phase of the Soviet economy are the intensive factors of development: to match the high level attained by the economy, an educational system of equivalent level has been developed for the entire population, turning out a veritable army of specialized high level personnel in every area of development. All this finds expression in an exceptional achievement - the spread throughout the whole country of compulsory secondary education and the ability of the system of training of high level staff to satisfy completely the needs of the national economy. In the new phase of Soviet development, the contribution which education makes to the economy acquires special importance.

One of the most important particularities of the national economy in this phase of development in the USSR is its completely fresh dimension, giving the educational and training system large-scale tasks. In the 1970s, the Soviet economy produced daily 10 to 15 times more than at the end of the 1930s. Its economic, scientific and technological potential has given the Soviet Union a top place in absolute growth in the production of a large number of basic products.

In line with development strategy for the 1980s, the eleventh Five Year Plan (1981-1985) foresees an increase of between 18 and 20% in national income, 26 and 28% in industrial output and 12 and 14% in farm output. During this period total investment is expected to rise to 711-730 billion roubles.

These few data give an idea of the tremendous scale of economic activity in the Soviet Union at this stage of its historical development. We may ask: what effect has this activity had on the evolution of higher education and training? What has its contribution been, and what efforts were necessary to satisfy the growing needs of the country for highly qualified personnel?

Broadly, the contribution of education may be indicated by saying that during the two Five-Year periods - 1971 75 and 1976-80 - 21.8 million qualified workers graduated from vocational and technical schools, and 19 million from higher educational or specialized secondary schools. Approximately 35 million girls and boys completed general secondary education.

In short, the number of qualified workers and specialists trained to higher and specialized secondary level, now in the economy, has gone up considerably. In 1979, 26.4 million qualified specialists - twelve million of whom went through higher education - were employed in the economy. In the same year, approximately 5 million engineers and technicians were working in industry (excluding kolkhozien and industrial undertakings and of the smaller auxiliary industrial workshops) compared with 2.9 million in 1965. Data for the month of April 1980 showed the distribution of kolkhoze and sovkhoze personnel as follows: senior specialists 164,000; agronomists 94,500; zootechnicians 84,000; veterinary surgeons 117,000; engineers and technicians 222,000. The number of mechanics rose appreciably (tractor and combined-harvester drivers) : 3 million in 1980 as against 2.25 million in 1965.

It may be concluded that the system of education and training of highly specialized personnel reached a level adequate, in quantitative terms, to satisfy completely the economic, scientific, technological and cultural needs of the country. Therefore, the perspectives of quantitative growth for the next five to ten years will be governed mainly by demographic factors and by structural changes in the economy of a qualitative nature.

These perspectives are outlined in an important document: "Guidelines for the economic and social development of the USSR for 1981-85 and for the period ending in 1990", approved by the 26th Congress of the Communist Party of the Soviet Union. During the eleventh Five-Year Plan (1981-85] it is planned to "ensure the subsequent development of the public education system, and satisfy to the full the country's needs in specialists and qualified workers". In this respect, an increase is foreseen in the network of professional and technical scholastic establishments so as to train up to 13 million workers in 5 years. In other words, the number of qualified workers with secondary education will rise by 1.6 times. It is planned to train approximately 10 million.

The contemporary phase in the historical development of the Soviet Union represents the transition to an intensive model of development, which is determined by the fact that attempts to solve quantitative problems by extensive methods are less efficient and that the quantitative method becomes less and less applicable. The question of quality and the efficiency of social production takes on crucial importance. This question has, of course, already found its place in the Soviet Union's economic policy in the past. Generally speaking, the quantitative aspect cannot be separated from the qualitative aspect. Today it is a fundamental feature of development, of its options and perspectives, as well as one of the methods applied in the solution of problems.

The most important basis of the intensive model of development and of the growth of output is scientific and technological progress. At the present time, the interaction of science and industry has intensified. This means that the technological level of production is determined increasingly by the successes of science, and scientific progress by the achievements of industry. Science is becoming an immediate productive force. The scientific and technological revolution is in itself a sign of the profound transformation both of the technological infrastructure of production and of the forms of organization and management of production. Under its influence, new branches of industry have grown up in the USSR, such as the atomic energy industry, electronics, precision instruments, the production of more recent materials such as plastics and synthetic diamonds, etc.

The results achieved serve as a basis for the setting of new objectives in the field of scientific and technological progress in the 1980s. The aim is to push every branch of the Soviet economy to the forefront of science and technology, thereby contributing to the creation of an economy to take the country into the 21st century.

The speeding-up of the scientific and technological process is one of the essential features of Soviet strategy for the 1980s - to complete the transition of the economy to intensification, to boost the efficiency of socialist production, and to obtain the best possible results with the minimum of expenditure and of resources.

The trends of development, the intensification of the economy, the growth of the efficiency and of the quality of production and, principally, scientific and technological progress - all in their own way influenced and will continue to influence, in multiple and often contradictory fashion, the manpower situation in the Soviet Union, and also its policy in the field of education and training of highly qualified personnel. What is the quantitative aspect of this process? This question is of tremendous importance, on account of manpower problems due to the worsening of the demographic situation in the USSR: However, in the intensive development model, problems of structure are given priority in educational policy. It is a question not only of training, but also of rational and efficient employment of qualified personnel, particularly vital during the present period.

The impact of different factors on the evolution (past and future) of manpower, and of the educational and cultural areas, is felt in various directions. We may indicate the most characteristic. These are:

(i) the raising of the general educational and cultural level of the population;

(ii) improvement in structures for the training of qualified personnel in relation to the increasing rate of obsolescence of specializations and introduction of new ones;

(iii) regular modification of study programmes, to take in account the rapid advance in national and world knowledge;

(iv) strengthening of the continuing character of education and awareness of the necessity for an adequate system of improving qualifications.

Let us turn now to the problem of sources of manpower which play a meaningful part in determining present and future trends in the employment policy of qualified personnel. In the Soviet Union a very high level of employment has been attained for the whole of the active population (Table 1), thanks to the full employment policy.

In the 1970s, unlike the 1960s, the active population working in individual small holdings or women engaged in household tasks had ceased to be an important means of employment.

At the end of the 1950s and the beginning of the 1960s, the manpower problem worsened in the Soviet Union on account of the long-term demographic consequences of the War (those born during the War years had reached working age). The entrance into social production of a large number of workers, up to then engaged in individual occupations, was the decisive factor helping to correct the lack of balance. From 1966 to 1970 the natural increase in manpower was twice that of the preceding five-year period. At the same time, the absolute and relative growth of the number of manual and white-collar workers (only 13.1 million people, i.e. 17%) was less perceptible compared with the preceding five years. This is explained by the sudden lessening of the influx of workers from individual occupations.

Table 1. Evolution of employment in the USSR (in percentages)

	1940	1959	1970	1975
Total active working population:	100	100	100	100
- those working in social production and studying, with interruption for work	66.0	77.4	90.6	90.9
- working in individual small holdings and occupations and engaged in household tasks	34.0	22.6	9.4	9.1

In the years 1966 to 1970 the natural growth of manpower, i.e. youth, was practically the only source of supply for the economy. In the years 1961-1965, due to young people, the additional needs of the economy for manual and other workers were satisfied to the extent of 29%, in 1966 to 57%, and in the 1970s to 92%-95%.

With the arrival on the market of masses of young people with secondary education, the contrast between the lag in rates of mechanization and automation and the high level of instruction of these young workers, was impressive, particularly as the young people were more demanding with respect to working conditions and towards technologigal equipment and the possibilites of improving their qualification. As a result, in many areas of production, contrasts were striking between the high level of education of the young workers and the technologically low level of the work, of which certain types had no need of any real creative spirit. At the present time, this is one of the main reasons for the fluctuation of young workers in production.

According to the forecasts, the workforce situation will remain problematical during the 1980s, on account of the long-term demographic consequences of the War years. In relation to the 1970s, the increase in the population of working age will diminish from 18% to 3.8%. To remedy this situation, the planning and economic organizations are compelled to take the new possibilities into more account, so as to raise productivity and speed up scientific and technological progress.

The transition to a new economic model - intensification of the national economy - meant a qualitative step forward in its development. In accordance with the aims of this study, let us consider the following questions. How did education react, faced with this new phenomenon? What social level corresponds best to this model? What is the evolution of the specialist's role in the process of economic, scientific and technological progress? These are difficult questions and a whole series of research studies, not just one, would be necessary to deal with them. The present study may provide some helpful elements.

The process aiming at intensifying the Soviet economy and increasing the effectiveness and quality of production took place at the same time as the introduction of complete general, compulsory secondary education. This was not a coincidence. Complete secondary education, general or specialized, is considered to be a necessary social level in educational development in a fully socialist society on its way to achieving the realization of an intensive model of development.

It is interesting to note that the development levels of these two phenomena tally. Even more important, that close links exist between them. It must also be said that the attainment of compulsory secondary education throughout the country has become a precursor for the use of intensive methods in economic development.

Secondary education is not the only example enabling a comparison to be made between the educational and cultural level of the population with the level and quality of the economy.

Another important factor is the general educational level of the population. According to census figures in 1959, 98.2% of the Soviet population aged between 9 and 49 could read and write; in 1979 the figure had gone up to 99.7%. The male educational level corresponds approximately to that of women.

The gradual closing of the gap between educational levels of rural and urban populations is continuing during the intensive development of the economy. Similar tendencies may be observed in comparing people in manual and intellectual occupations where, in spite of existing differences, inequalities concerning the educational level continue to diminish. One may assume that, with the complete introduction of the intensive model of development, these differences will become minimal, or disappear completely.

In a multinational socialist state, the economy cannot pass on to an intensive model of development if the process is not accompanied by a continuing reduction of the differences in educational levels throughout the country. It may be said that at the beginning of the 1980s in the Soviet Union the same general educational level had been reached in all the national republics.

The high educational level is also evident in the growing numbers of intellectuals in the USSR compared with other categories of the population. The importance of the role of specialists, having received higher education, as well as those of specialized secondary education, increased following economic development. For example, in 1960 the group consisted of only 10.4% of the total number of workers; in 1975 it was 15.7% and in 1979 almost 25%.

The highest growth rates were of engineers and technicians in industry. During the period from 1965 to 1978, the growth of the total number of workers in industrial enterprises was 31%, and that of engineers and technicians (ITR - engineers and technicians of secondary education) 67.7%.

The increase in the number of engineers and technicians was directly linked to the rise in the scientific and technological level, to the modernization of production, to the extension of scientific research and to the elaboration of construction projects in industrial plants. However, during the 1970s, compared with the 1960s, the rise in numbers of engineers and technicians slowed down, on account of the use of intensive methods in the economy. During the period 1960 to 1969 the number of ITR compared with industrial workers rose by 2.7% but from 1970 to 1978 the figure was 1.7%.

One specific feature of the present phase of Soviet development is the elimination of the disproportion between the training of specialists and the country's need for them. At present, the planned demands for young specialists in all ministries and organizations have practically all been met. Although formerly certain jobs of engineers, technicians and managers, in industry and construction,were not filled by highly qualified workers, today they are occupied almost exclusively by graduates from higher educational establishments and specialized secondary schools.

Under present day conditions, scientific and technological progress is unthinkable without a constant raising of the level of general and technical education, and without an assurance that the necessary specialists, particularly engineers and scientific workers, able to create new techniques and to perfect the technology of production, will be available for industry and scientific research establishments.

3. STRUCTURES, METHODS AND CONTENT OF HIGHER EDUCATION

3.1. Student recruitments: social aspects

In the Soviet Union, the socio-cultural demand for higher education is very great: according to sociological surveys it is not towards the working world that pupils are directed on leaving secondary school, but rather towards higher education. This may be explained by the following factors:

For very many years, the secondary schools' aim was the preparation of pupils for higher studies.[1]

---

[1] In the USSR all citizens under 35 years of age, irrespective of material situation, social origin, sex or nationality, having completed secondary school education and passed the entrance examination, may enrol for full-time study in higher educational establishments; and all citizens, without age limit, in evening and correspondance courses. Admission to VUZ is governed by general State rules.
Selection for higher education colleges is by entrance and competitive examinations. These are carried out by commissions composed of professors and teachers, according to a single programme. The admission rules to higher educational establishments provide for the necessary continuity between the general secondary and the institution of higher education. Students having obtained a gold medal on completion of secondary studies are admitted to a VUZ according to the results of examination in one of the principal subjects: enrolment is allowed without entrance examination in disciplines where there is a serious shortage of specialists. The average marks obtained in the general certificate of education, awarded on completion of secondary school, are taken into account in assessing results of entrance examinations to institutions of higher education.

The reason for this was the shortage of highly qualified specialists in the country, and it was the general secondary school which provided the necessary basic instruction for the continuation of studies in higher educational establishments. This explained its orientation: the preparation of candidates for the VUZ.

During the 1960s it become obvious that this orientation had to be changed: the general secondary school needed to prepare pupils for wide varieties of social work (intellectual as well as manual); it had to become the basis for future studies not only in the VUZ but also in all types of scholastic establishments. To this end, measures were taken to widen children's education in the secondary schools through productive work, and to raise the prestige of manual work, this contributed greatly to a change in pupils' attitudes, and those of their parents, as regards higher education.

Many and varying factors influence the choice of an occupation requiring higher education, amongst which, for example, a pupil's social background, family educational level, life style, specific historical conditions and special features in the training of the peoples in the republics, the level of town planning and industrial development of different regions of the country, etc. To a certain extent, the choice of a VUZ is influenced by criteria of sex and age, as well as differences in levels of knowledge required in certain disciplines. Sociological surveys show that girls prefer to pursue higher education in the humanities and medicine, while boys aim at higher technical engineering education.

Pursuit of higher education is also determined by social background (see Table 2).

Variations can be explained, first, by the fact that intellectuals have a marked preference for an intellectual occupation for their children; secondly, by the fact that the conditions of cultural development) amongst the families of workers, kolkhozians and intellectuals are on different levels. The higher cultural level of intellectual families creates more favourable conditions for the children (whose parents, generally, have gone through higher education, either complete or incomplete) to obtain admittance to the VUZ. A psychological barrier exists amongst young workers and kolkhozians, thus increasing the difficulties of entrance to the VUZ.

In the Soviet Union, a positive trend may be noticed towards a closer approach in the social structure of students to that of the population (see Table 3).

Table 2. Orientation of those leaving secondary school to pursue full-time higher education, according to social origin

Social origin	Percentage of people questioned in corresponding social group
Working family	34.3
Kolkhozian family	23.0
"White collar" and specialist family	70.4

Table 3. Social structure of population and of students (day schooling)

Social groups	Distribution of population according to social group		Proportion from different social groups among the students (school year)	
	1970	1977	1969/70	1975/76
	%	%	%	%
Workers	56.8	61.6	37.1	47.5
Kolkhozians	20.5	15.7	8.5	7.5
Employers	22.7	22.7	54.4	47.0

From the beginning of the school year 1969-70, within the universities and the specialized institutes, preparatory sections were set up to improve the level of general education of young workers, kolkhozians, and those having completed their military service, in order to prepare them for and facilitate their access to higher education. The admittance of these young people to these sections was based on recommendation from the industrial enterprises, workyards, transport and communications organizations, sovkhozes and kolkhozes. For those wishing to enrol in these sections, secondary school certificate was necessary and at least one year's practical work.

The State also adopted several measures granting adavantages to those enrolling in the VUZ who had a minimum of two years' practical work, thus increasing the number of young workers and kolkhoziens amongst the VUZ students.

In addition, it is a widespread practice in the Soviet Union to allow admission to VUZ without examination for specially advanced workers chosen by their enterprises for higher studies. The selection of such candidates takes place during workers' meetings, after examination of the proposed students' files. This practice is considered an encouragement for the high quality of their practical work. During the period of construction, these workers receive a special grant allocated by their enterprises which is 15 % higher than the usual state grant. After completing their VUZ studies, they must then work for three years in the plant or factory which had sponsored them, although, with the latter's permission, they may be transferred to other enterprises. The system of education without interruption of occupation ensures wide opportunities for higher study for all industrial and agricultural workers. The possibility to really take advantage of this type of higher education is assured by a system of State benefits for students. Those accepted in higher educational establishments, either evening classes or correspondence courses, receive additional leave with remuneration. First and second-year evening class students are given 20 days' paid leave to take their examinations and tests and carry out laboratory work ; VUZ correspondence students have 30 days' paid leave ; 30 and 40 days' respectively are granted to students in upper classes. From the third year, 30 days' leave is allowed in VUZ evening and correspondence courses for State examinations, and four months' paid leave is granted for preparatory work and submission of diploma project. In addition, an extra month's supplementary leave without payment is accorded for preparation of diploma projects, and 15 days for the examination. Students attending VUZ evening and correspondence courses are allowed one extra day a week, on half-pay, but not less than the minimum salary, for their preparatory studies. In all, during the whole period of VUZ studies, additional leave accorded amounts to approximately one year.

Certain other advantages are available to those studying without interruption of their work, which include for example supply of books and materials required.

In the USSR, the guiding idea behind the system of education through evening classes or correspondence courses has been to give a real possibility of higher study to people who, for one reason or another, were not able to continue their studies before, and who do not now want to interrupt their occupation. It is also a very good way of raising the cultural and technical level of working people. Many workers, kolkhozians and technicians have become engineers, teachers, agronomists, etc., thanks to this system.

However, it must be pointed out that during the 1970s this type of instruction because less important than that of full-time education, compared with the preceding period. It was decided at that point to increase the numbers of students studying full-time.

3.2. Intensification of the educational process and the quality of training

The speeding-up of scientific and technological progress makes the intensification of the educational process all the more essential in establishments of higher education, since this is one of the most effective means of improving teaching quality. In actual fact, students of higher education have to assimilate an ever increasing volume of information. This problem cannot be tackled otherwise than by finding ways to improve the art of teaching - its forms, methods, and the degree of its intensity. It is quite obvious that today, the quantitative approach - for example prolonging the duration of study, or broadening the study programme - cannot have a really serious impact on the problem.

The quality of teaching is the determinant factor in the future attitude of specialists towards their work and the degree of satisfaction they find in it (Table 4).

Table 4. Level of satisfaction of engineers in their work in industry (percentage)

		By industrial sector			
Attitude towards work	In industry Total	engineering	textile & light industry	chemical	research institutes
Very satisfied	21.2	18.7	18.8	19.2	23.0
Satisfied	41.6	39.0	40.0	43.6	42.8
Indifferent or no opinion	9.9	9.7	9.2	9.6	10.2
Discontented	27.3	32.6	32.0	27.6	24.0
Total	100.0	100.0	100.0	100.0	100.0

Dissatisfaction largely influences fluctuations amongst specialists. A survey conducted amongst teachers gave the following concerning reasons for such fluctuations:

- family and personal reasons	41.7
- dissatisfaction with salary and organization of the work	22.6
- dissatisfaction with housing and general living conditions	18.3
- other reasons	5.8

In the present climate of scientific and technological advance, in order to intensify the educational process and improve the qualitative features of higher education in general, the trend is towards a careful selection and simultaneous use of those elements most likely to enhance quality in specialist training. The measures aimed at enrolling students of a high level in the VUZ, and the training or each new group, are the first steps in the elaboration of a complex approach to the problem. The next stage covers the entire duration of studies in the VUZ and includes multiple activities, such as types and methods of teaching, correlation of the teaching content with the demands of the scientific and technological revolution, e.g. the place of the basic sciences in specialist training, strengthning of links with production, involvement of students in scientific research, etc.

A sound, general scientific training has always been part of the Soviet higher educational system; one cannot become a real specialist without a certain knowledge of basic subjects. At present and as a direct consequence of the scientific and technological revolution, this has become a new aspect of training. A clear trend can be observed towards strengthening the basic sciences in specialist training. Thus, in VUZ curricula, general and theoretical scientific knowledge is now given priority over specialized courses.

What does it actually mean, the rational combination of a broad general scientific teaching with an in-depth knowledge of a specific speciality? This question has always been in the forefront in the development of higher education in the Soviet Union as it is today. This combination is not a rigid rule, laid down once and for all. It varies according to the aims of development and the main features of the speciality itself. In our day, this trend is vital in the preparation of specialists for their future independant activity and determines the modern development of Soviet higher education.

In this age of scientific and technological revolution, the quantity of information grows inordinately, and half of what is taught to the student in a higher educational establishment becomes obsolete every ten years. The strengthening of basic sciences in curricula is intended to ensure flexibility of specialized training, versatility in higher education, and the possibility of adapting to today's requirements. It is also intended to inculcate into the students the qualities necessary not only for absorbing knowledge, but for educating themselves, to know how to appreciate the importance of what they are taught, and to put it usefully into practice.

The increasing rôle attributed to the basic sciences in Soviet higher education serves as a basis for the definition of a specialist with wide-ranging, broad qualifications. It is definitely not a question of training so-called "generalists" who "know everything" but in fact know nothing when it comes to in-depth knowledge. In the same way, it is not a claim to turn out specialists capable at every turn of changing jobs, or obtaning new qualifications. The idea is to give good, overall, general and theoretical scientific training for each specialization in the various branches of the economy; and to determine the amount of basic scientific knowledge which the student must learn, taking into consideration the development of science and technology. The conception starts from the principle that the activity of such a specialist is more effective from a creative point of view. A limited specialization narrows his scientific and technical outlook, and reduces the possibility of his creative approach towards the perfecting of technological processes and the determining of production perspective (Table 5 gives interesting information obtained from surveys).

The actual materialization of this concept of a specialist required considerable modifications in the system of teaching in the higher educational establishments, so as to increase the number of hours given to general science subjects, and to incorporate the more important achievements in science and technology in the curricula.

This fundamental training of young specialists means widening knowledge of the social sciences and humanities for students in natural science and technological faculties and, for students in the arts faculties, increasing knowledge of scientific disciplines, particularly mathematics. Students preparing an engineering degree will have more extensive information in the field of law and aesthetics. The study of human sciences is linked, among other subjects, with teaching on the interaction of man with the biosphere. This requires the introduction of the use of quantitative analysis methods as a component of the curriculum for specialists in human sciences.

Since the training of specialists is a long-term affair, the educational system inevitably mirrors not only the present level of scientific and technological development, but also the short-term (and if possible long-term) perspectives of such development as well as the organization of production. For this reason, some time is reserved in the curricula for the possible introduction of new, up-to-date information, and the study of other disciplines, according to the wish of the students, is also foreseen.

Table 5. Influence of type of specialization on creativity of young specialists

	Professional activity				
	Patents and introduction of rationalizing projects	Petitions for inventions	Work published and interventions made at conferences	Various	Nil
Specialists with wide-ranging, broad qualifications	23.1	20.7	55.4	22.3	32.2
Specialist with specific qualifications	16.5	8.8	13.2	12.1	62.1

	Social and political activity, participation in work			
	Of elected social organs	In offices of construction projects and for scientific organization of work, etc.	As local speakers and leaders	Writing for the local press
Specialists with wide-ranging broad qualifications	43.0	5.8	25.6	11.6
Specialists with specific qualifications	30.8	8.8	17.6	14.3

It should be mentioned that the elaboration of new curricula for full-time higher education was completed in the middle 1970s, nevertheless such changes and modernization of curricula and programmes are not definitive, and are open to periodic modification.

A systematic revision of the list of specialities and specializations, the introduction of new specialities into each VUZ, and the elaboration of the necessary qualifications for each of them, are important elements of Soviet policy for the intensification of higher educational and specialized secondary educational development taking into consideration three groups of specialities:

- specialities in which the economy's needs are entirely satisfied;
- groups of specialities to be introduced in the light of scientific and technological progress.

At present, the list of VUZ specialities includes over 400 items, and that of specialized secondary schools over 500. There lists are relatively stable, although subject to modification and improvement as a result of new developments in scientific and technological progress. It is not only the workers in the planning services that that participate in this improvement and modification, but also workers in the areas of science, production and services.

It is also very important to define which qualifications are needed for each speciality, the type of knowledge and practical experiences required by each student in his speciality, and the job he may eventually hope to occupy in the various branches of the economy.

To obtain a school-leaving certificate (from any institution in the Soviet Union) it is necessary to acquire a certain minimum level of knowledge defined by a compulsory list of subjects in each speciality - which make up the content of the programme and also constitute a State document - and by the minimum information that pupils must be given in the main scientific disciplines, fixed in the educational programmes.

During the first years in the higher educational establishent, there exists a compulsory common core of subjects for each speciality, but afterwards it is possible to choose amongst the various disciplines. The student must devote 30 to 35 hours a week to personal study. During his training each student has to pass 35 to 40 half-yearly examinations, excluding written and oral control and inspection.

The main special feature of Soviet higher education is liaison between theoretical and practical teaching. The practical course represents for students a really integral part of their education. Throughout their studies they go through various courses, each one increasing their theoretical knowledge and assuring the acquisition of certain practical experience: in enterprises equipped with the latest advanced technology, in establishments and orzanizations of different branches of the economy, culture, public health, education, trade and State management.

As a rule, during the early years, the professional training course takes place in study workshops, laboratories, clinics, training grounds, experimental agricultural centres and in other auxiliary educational sectors within the framework of the higher educational establishments, as well as in schools, enterprises, institutes and organizations. A preliminary training course is provided before the diploma in certain specialities, the content of which is in accordance with the subject of the diploma or of the diploma project. The aim of such a course is the researching of material on the professional activity in a relevant enterprise for the preparation of the diploma.

The final stage in the training of specialists is the State examination, or defending a thesis for a diploma, which is prepared during the last semester.

Diploma projects have, above all, an educational aim, although their subject is always of current interest, and is linked to specific aspects of industry, transport, construction, communication, etc. Often diploma projects are applied in construction or in industry for the reconstruction and improvement of installations or technological procedures.

Sometimes, for example, in universities, the practical course is the carrying out of the degree work which in itself represents real individual scientific research.

In a technical VUZ, diploma projects which give the student the possibility to complete his training as an engineer are generally preferred. During the diploma work the student enjoys wide freedom of action: he can consult his professor, but sometimes the consultant may be a production specialist. Projects and diploma work are defended before a State examining committee in which representatives from relevant branches of industry take part.

The professional training course has now become a normal link in the chain: secondary/higher education - production. The following chapter will be devoted to other ways of strengthening the bonds between these two links in the chain. But here it may be useful to stop and consider the "VTUZ" factories, a new style of educational establishment, enabling a student to study whilst continuing to work ; the VTUZ have a wide and fruitful experience of teaching and training highly qualified specialists.

VTUZ-factories are set up within the framework of large industrial plants, with the specific purpose of training specialists by alternating study with productive work in the enterprise itself.

Normally, the VTUZ-factory trains the student for work in the plant within which it is incorporated; but it may happen that workers from other plants, training for similar work, may also be sent to this VTUZ. The best trained and most progressive and gifted workers, with at least two years' productive work behind them, and having completed secondary education, are recruited for study in a VTUZ-factory. The plant's directing board and the social organizations involved and responsible for selection and recommendation of workers. Choice of a student for a VTUZ is looked upon as an incentive to progressive workers with good results in professional output.

Training in a VTUZ-factory lasts from five and a half to six years. Theoretical courses take place with or without interruption of work. In either case, the duration of teaching periods is decided taking into consideration production requirements, and the curriculum. However, for courses requiring interruption of work, this must not exceed five months during the academic year. During this time, VTUZ-factory students continue to be considered as staff of the plant in question. The study period in a VTUZ-factory is 10 months per year.

Teaching is by means of theoretical courses and practical work during the entire study period, and this entails wide use of production facilities and laboratories available in the plant. The VTUZ-factories train specialists of a technological type mainly in the specialities for which the production processes of a large plant can serve as an education, occupational, scientific and technological basis of a required level.

The combining of theoretical and practical training with the work of the students in a plant varies - according to experience, progress in the educational system and the higher colleges - according to the technical posts. Classes take place in study rooms, or offices and laboratories of the factory, as well as in workshops, and on training grounds of the plant in which the VTUZ-factory is incorporated.

The study programme in a VTUZ-factory covers the same general theoretical disciplines as those established in the curricula for the corresponding specialities in higher technical establishments. To broaden the general theoretical training of the students, in conformity with the resolution of the VTUZ-factory committee, during the last years of the course, special supplementary classes may be included in the curriculum such as advanced mathematics, theoretical mechanics, physics, chemistry, etc., all of which are important in specialist training of a certain type. Certain extracts of the manual on general theory are studied, together with some specialized subjects, during production: students must carry out a practical work series at their machines as workers, and learn individually the material in their manual. The plants housing VTUZ-factories provide classroom space free of charge, together with equipment and teaching materials for study workshops. The highly-qualified specialists in the plant are invited to participate as teachers in the VTUZ-factory.

3.3 Interdependence of teaching and research

In the Soviet Union there are specialized scientific research institutions working within the framework of the Academy of Sciences of the USSR, and of its affiliates, the Academy of Republican Sciences, and the institutes of sectorial scientific research attached to ministries. This does not in any way lessen the importance accorded to the development of scientific research in Soviet higher educational establishments. First of all, the combination of education with student scientific research activities is an essential condition for improving the quality of specialist training. Experience has shown that the quality of this training is higher in the VUZ where scientific research is well organized. Secondly, higher education possesses a considerable scientific potential capable of helping to find solutions to important scientific and technological, as well as economic problems.

In the current period of intensive development of the economy in the USSR, the rôle of higher education in increasing scientific potential has become more important than ever. Higher educational establishments are a source of new ideas and theories in the field of science and technology, and the organization of production. There are approximately 58 scientific research institutes functioning in the VUZ and approximately 1,500 experimental laboratories in industrial branches. About a third of the total number of the country's scientific workers, almost half of those persons holding scientific qualifications and degrees, work therein. Each year the number of highly qualified scientific and teaching personnel in higher education grows larger.

The main source of such personnel in the USSR is the post-graduate research studentship system which exists both within the VUZ and in the other scientific establishments. Thanks to this, a flow of highly-qualified graduates is assured for the different branches of industry, according to specialization, and for the regions. The VUZ post-graduate system thus fulfils a most important regulating function in training research workers in natural and human sciences.

Soviet higher education affords considerable importance to training scientific and teaching personnel to the highest degree - the doctorate of science. This training is individual, involving research work in fields with particular importance for scientific and technological development.

The award of doctorate of science is made after submission of a thesis considered as a contribution to a new scientific aspect. Those preparing a doctoral thesis can count on unstinting help: candidates working on serious scientific research are released from their teaching duties, and this is one of the most effective forms of help; they are assigned the duties of higher scientific assistant for a period of two years, to enable them to finish their thesis.

Within higher education there are unrivalled possibilities for the development of scientific research.

To start with, the VUZ have the advantage of bringing together groups of creative and dynamic people from different scientific disciplines, which is most important, since new discoveries often appear at this junction or meeting-point of the sciences.

Secondly, there is a constant flow of young scientific specialists through the VUZ. Science tends to develop creative talent among its students. More than 2.4 million students - more than 80% of the total number of students today - participate in all kinds of scientific activities. During the years 1976-1979: 6,500 authors' certificates were issued, over 81,000 articles published, and 58,000 student inventions were put to practical use in the national economy.

At present, the most widespread types of scientific research by Soviet higher educational students are:

- Introduction of elements of scientific research into laboratory work, into course projects, and into practical exercises;
- preparation of scientific draft outline surveys on subjects of basic science, general engineering sciences and specialized sciences;
- carrying out of 50 to 200 hours' research work depending on the branch, as foreseen in the programme of study;
- carrying out of scientific research during preparatory work on diploma projects.

Subjects for research by students are generally based on the programme of scientific research established by professors and sections of the VUZ.

The results of scientific research and laboratory and experimental work, in which students have participated, are often introduced successfully into production. In several higher educational establishments, one form of organization of student creativity is very widespread; this is the network of construction project offices and technological bureaux. There are already more than 300 with a quota of 12,000 students. Certain student scientific organizations carry out work on construction projects which are of great importance for the economy.

Conditions in a VUZ enable more efficient handling of complex research than in industrial and other inter-disciplinary branches. In a VUZ the risk of a negative result will be less than in the research establishments themselves since, whatever the outcome, another equally important "finished article" is produced - a highly qualified specialist well used to working on scientific research.

Taking into consideration the importance of scientific development in the VUZ and its contribution to scientific and technological progress, the Central Committee of the CPSU and the Council of Ministers of the USSR adopted, in April 1978, a resolution on "... the growth of effectiveness of scientific research work in higher educational establishments". It envisages measures for the improvement of planning and co-ordination of scientific research work in the VUZ. Certain aspects of the problem are given particular attention: concentration of ways and means to solve the more pressing problems, the elimination of wasteful, parallel and duplicated research, efforts aimed at strengthening and better utilizing in the future the scientific basis of experimental laboratories and construction bureaux. In this connection, scientific research groups, in the 70 principal VUZ, are organized on the basis of existing research units. As regards the planning and financing of these research groups, as well as the provision of the material and technical aid necessary, they benefit from the same favourable conditions as those enjoyed by specialized scientific research institutions. The number of professorial staff, lecturers and auxiliary personnel for these VUZ may be increased beyond the established quota. On the other hand, VUZ scientific workers must complete their teaching stint (i.e. up to 240 hours per academic year) within the framework of their working day. For big towns, an increase is recommended in the number of inter-school centres of aid to scientific research which help all VUZ regardless of their administrative dependence.

The higher educational system in the USSR is increasingly taking on the aspect of a huge unrivalled scientific research centre, with two objectives: to train the necessary specialists to meet the needs of an intensive model of development of the economy, and to develop those scientific research activities which make a notable contribution to socio-economic and scientific and technological progress. In the eleventh five-year plan, extensive changes are envisaged in the specific character of scientific research in higher education in the USSR.

3.4 Qualitative results in higher education in the USSR

The data in Table 6 show clearly the present development trend in Soviet higher education. Let us take an example. In 1965, a total of 863,700 people were admitted to higher educational establishments, of whom 403,900 have graduated. In 1970, the figures were respectively: 911,500 and 630,800 and in 1975, 993,800 and 713,400. A simple calculation shows that if, for example in 1975 the coefficient for the year had been maintained at the same level as for 1965, the number of specialists graduating would have been 619,800 and not 713,400, i.e. 93,600 less. This is one result of the improvement in the quality of teaching for the single year 1975; also we note that the number of students per teacher with a scientific grade was 27 in 1978 compared with 52 in 1965, i.e. a diminution of almost 50%. This brought simultaneously a big improvement in teaching quality and an increase in educational expenditure. Thus, quantitative needs were counterbalanced by improvement in the quality of higher education, this is a basic trend in Soviet development for future years.

The improvement in Soviet higher education is, in a word, a question of professional and moral qualities which must be instilled into students - future specialists. The survey carried out among the higher classes of 9 VUZ is very revealing in this connection. The question was: "What qualities should a VUZ graduate possess in order to fulfil the demands made of a modern specialist? Estimate each quality on a basis of five points (5 points being the highest mark; 1 point, the lowest)". The results are given in Table 7.

Table 6. Qualitative indices of higher school activities (1956 to 1978)

	1965	1970	1975	1978
Overall coefficient of graduation (ratio of output to intake 5 years previously)	0.68	0.74	0.78	0.82
School buildings and laboratories in VUZ in square meters per full-time student	7.0	7.5	8.2	8.4
Number of students per teacher in VUZ	19.0	13.0	12.0	11.0
Number of students per teacher with scientific degree	52.0	38.0	30.0	27.0
State expenditure (without investment) per student[1], in roubles	781.8	850.1	1,000.8	1,015.0

---

[1] The number of students enrolled in correspondence courses or evening classes is estimated on the basis of norms laid down for full-time students.

Table 7. Qualities of a specialist: assessment made by students

Qualities of specialist	Appraisal (percentage in proportion to answers)					
	5 pts	4 pts	3 pts	2 pts	1 pts	Average
1. Wide-ranging professional knowledge	85.6	12.3	1.8	0.1	0.2	4.82
2. Lofty moral qualities	70.2	19.1	6.7	2.2	1.8	4.53
3. Broad social culture	66.9	26.6	5.9	0.9	0.7	4.5
4. Ability to work in a community and create a pleasant social atmosphere therein	57.1	29.3	9.3	2.3	2.0	4.32

Soviet students value very highly real professional qualities, wide social culture, lofty moral qualities and the ability to work in a community. They know that a specialist must be not just a professional in his own subject, but also an organizer, and educator, someone of wide cultural horizons. These are the great professional and moral values underlying the prosaic indices of the quality of work in higher education in the USSR.

4. HIGHER EDUCATION AND PRODUCTION

In the Soviet Union the development of links between higher education and production is to the mutual benefit of each. In some cases, they are guaranteed by official contract, at State level, or by financial contract between a higher educational establishment and as enterprise. Such links do not necessarily cease on completion of studies, when the graduate, having obtained his diploma, leaves the educational establishment. Indeed, several aspects of these links relate to the post-education period.

4.1 VUZ and the enterprise: educational and occupational objectives

The Soviet experience has shown that both sides benefit from the development of links between institutions of higher education and enterprises, from which the State, society and the economy also gain. A whole series of ways of collaborating, having proved their very real usefulness, are established in the course of such development.

What do the enterprises gain from this arrangement?

Their main interest is quite simply, the "finished article" of the VUZ, namely a highly qualified specialist able to measure up to the growing professional needs of the enterprise. The development of many types of links with higher educational establishments gives them this possibility, since in this way they may influence the orientation, the content and the quality of the student's training. Thus the enterprises can, in a concrete manner, get to know their future specialist, from a practical, professional and personal point of view, long before he takes up a position in the enterprise. And they can familiarize him on the spot with working conditions, problems and difficulties of the plant, and its aims and perspectives.

The advantage for an enterprise in having direct contacts with a VUZ lies in other ways. For example, the sponsorship of a factory by a higher educational establishment is a widespread tradition which permits the organization of scientific consultations, the dissemination of scientific and technological knowledge among the staff and the raising of their technical level. It is also in the plant's interest to send their own specialists to the VUZ, to improve their qualifications, and we shall speak of this later in the chapter. Another important aspect is the carrying out of scientific research at the VUZ, at the request of the enterprise.

The higher educational establishments also need to develop contacts with the enterprises.

The first very important link in the chain 'VUZ-enterprise' is the professional course for students, which is based on a medium-term contract-plan, consisting of the establishment of contractual rights between the VUZ and the basic enterprise in relation to the course over a period of five years. As a general rule, model plants are selected as the basic enterprise responsible for the course.

The importance of this course lies not only in the fact that the student deepens his theoretical and specialized knowledge by using it in the production sphere, and in taking part in the life and activity of the factory; it also helps to make the future specialist more self-assured, helps him to take the first steps in his professional life; it is the start of his career in a community where he will work a few years later.

Higher educational establishments in the USSR have accumulated considerable experience in the organization of such courses. The creation within an enterprise of a so-called 'basic faculty', and the attribution of permanent places in practical courses for VUZ stadents is a form of strengthening relations between the enterprise and the VUZ and represents a great advantage in this respect.

As a result of the development of science in the VUZ, and of this co-operation, the teaching personnel feels less cut-off from practical professional activity, since they can keep up to date with new equipment, technology and the way the work is organized. The participation of the scientific and teaching staff in resolving current problems of scientific and technological progress in an enterprise, induces the latter to finance the material and technical basis and the payment of staff in the research sections of the VUZ.

Another aspect of the relations of the VUZ students with the enterprise is their participation in scientific and technical research within the institution of higher education, which is at the request of, and in co-operation with the enterprise. The extent of such collaboration grows ever wider, helping to speed up scientific and technological progress in the enterprises and thereby contributing to the solution of specific economic problems.

A financial agreement between the VUZ and the enterprise concerning the subjects of practical importance to be elaborated by the VUZ is the most usual form of such scientific collaboration. The plants pay for certain types of work (e.g. scientific, experimental, technological and constructional research work as well as the efforts made towards raising the standard of the qualifications of directing staff, engineers and technical workers). Thanks to this arrangement, the VUZ, paid by the enterprise under contract, are able to maintain the personnel working on scientific and auxiliary research, and to use the 75 per cent economy thus obtained for the purchase of installations and equipment to strengthen and increase the material teaching base. The VUZ may ask their teaching staff and students to carry out scientific research work according to contract, paying up to 50 per cent of the teachers' salaries and up to 50 per cent of students' grants. But, in certain cases, research conducted in the VUZ under contract has negative aspects, such as being directed towards limited practical problems, linked to too specific needs of the enterprise, and the level of the tasks not always in accordance with the teachers' qualifications.

The participation of students in scientific research common to the VUZ and the enterprise assumes various forms. One is the direct involvement of the students in a piece of research, the subject of which has been laid down in the contract. The carrying out by the students of course and diploma projects in production is as advantageous as it is useful. Every year it results in big economies. This form of collaboration is often initiated by the VUZ which, however, only benefit from moral satisfaction. It is proposed to normalize this arrangement by contract. The VUZ would then have extra means to develop their scientific base, and the enterprise would have the advantages resulting from the carrying out of useful propositions.

Contractual arrangements between VUZ and enterprises are growing and widening and taking multiple forms. This type of collaboration is promising, responds to mutual interests, and allows both sides to contribute to scientific and technological progress in the country.

4.2 Planned placement of qualified specialists

The admission of a young man or woman to a higher educational establishment can be looked on as a mutually reciprocal obligation. The VUZ, on behalf of the State, has an obligation to ensure the appropriate conditions to turn the student into a highly qualified specialist, taking on the necessary expenditure for this training, and the obligation to place him or her in a job according to speciality. The student's obligation is to use to the full this opportunity to pursue higher education, to obtain the required diploma, and to work in an enterprise for three years, according to the placement plan. This is compulsory, ensuring the interest of both parties. It should be emphasized that the most important point - i.e. the allocation of a job to the young specialist[1] - is the fundamental right to work for a Soviet citizen, which is guaranteed by the Constitution of the USSR.

The State's obligations are not limited to fixing by law the students' rights to free education and a job on completion of higher education. Students receive a grant and other material assistance: approximately 80 per cent of the total number of full-time students receive grants. Those who have to move to other towns to pursue their education are admitted to students' hostels, and in certain big towns well-equipped student campuses have been built. The State covers expenses for the upkeep of the residential hostels, the students having a preferential tariff.

As in the case for all Soviet citizens, students are entitled to free medical care, including places in sanatoria and convalescent homes. During summer or winter vacation, the majority are offered places free or at a subsidized tariff, in tourist or sports centres, or health farms. Many educational establishments are equipped with a stadium, sports ground, clubs, swimming baths, and are furnished with all necessary material for sport. All these facilities are free of charge.

The young specialists are first of all transferred to those plants, workyards and launching yards most in need of such staff. A month's leave with pay is accorded, before starting work, to all those assigned a job at the end of their studies: a special allowance and travelling expenses to the workplace are paid for those transferred away from home.

One of the main aims of the policy of the enterprises is to create the appropriate conditions for young people coming from higher educational establishments to become experienced and mature specialists during the compulsory three-year period; to help to organize their private life, for example, by finding housing for those needing it. It is forbidden to transfer a young specialist to work unrelated to his speciality or to dismiss him without the agreement of the sponsoring ministry. The enterprise is also called upon to contribute to raising the professional standard of the young specialists, and to promote those among the better qualified to posts as engineers, technicians, or to managerial jobs.

The allocation of jobs is by a committee. The rector of the educational establishment, as chairman of the committee, participates, together with representatives from ministries sponsoring the specialists, and representatives from social and student organizations of the educational establishment. If necessary, heads of faculties, sections and main departments may also be on the committee. Representatives from the enterprises to which the young people will be transferred are also invited. In selecting a workplace the committee takes into account the student's speciality, academic results, family situation, health, and participation in scientific research and social work.

---

[1] 'Young specialists' are those who have completed their studies in a daytime higher educational establishment or specialized secondary school, and have worked in the economy for 3 years, according to the placement plan.

The allocation of jobs by the committee is done democratically, in that personal preferences of the young specialist as to his future work are taken into account. The graduate is informed as to his future work place, the post he will occupy, salary and type of housing proposed. Decision is on a show of hands.

In cases where the work proposed does not match up to the speciality or qualifications of the graduate, or where necessary housing is not offered, the Committee may transfer him elsewhere, as foreseen in the plan, at their discretion or at the request of those young people who have the possibility to find employment individually, and this is the so-called "free diploma". The higher and specialized secondary establishments are obliged to find adequate work for this type of specialist.

The placing of graduates is carried out according to a plan worked out by the higher educational and specialized secondary establishments, and the sectorial ministries involved. The educational institutions prepare a file with recommendations for the allocation of posts, taking into account the graduate's speciality, the aim of his studies or the character of his special skills, of family situation, etc. The ministries responsible for the educational establishments centralise the information, and the recommendations as to assignment of jobs, reach agreement on these documents with all the ministries concerned, before submitting them to the USSR GOSPLAN and to those of the Soviet Republics.[1] The two groups of ministries, those which represent the demand for specialists, and those responsible for their training, confer together on the problems of allocation and draw up recommendations for transfers and for utilization of the specialists.

---

[1] In the USSR, a large number of higher educational establishments are subordinate to MINVUZ - of the USSR and the Soviet Republics - and a small number of the relevant sectorial ministries (for example, ministries having their own VUZ such as the Ministry of Commerce, Ministry of Public Health, Ministry of Education, and others). At the same time, a large number of specialized secondary schools are subordinate to sectorial ministries and a small number only are part of the system of MINVUZ of the USSR and the Soviet Republics.

During the final stages of the drawing-up of the plan for placement of the young specialists, the first group of ministries concerned informs the second group of the places available in each educational establishment, giving name and address of the enterprise or organization, nature of the job, salary, type of housing proposed. The plan is sent to all higher educational and specialized secondary establishments. The assignment of posts to VUZ and Technicum graduates is then organized according to the plan. For final-year students the posts are allocated at least four months before the end of their studies.

The new dimensions of higher education and the extraordinary increase in the needs of the economy, the intensification of all spheres of development in the country, the importance of qualitative factors in economic, scientific and technological progress, mean that it is essential to perfect the procedures described above. The scientific and technological revolution has brought in its train new problems which demand fresh methods to tackle them. To put it more precisely, difficulties have been encountered in the placement and utilization of graduates from higher and specialized secondary educational establishments; it has been found necessary to draw up a more accurate plan and to check the authenticity of requests for specialists from "consumer-ministries", in particular when it concerns those of a highly specialized nature. It is essential to match more exactly the qualifications of the young specialist, obtained in a higher educational establishment, with the work proposed; to give more prestige to the work of an engineer, to revise staff lists of technical workers and engineers keeping primarily in view the jobs requiring compulsorily an engineering diploma, which cannot be filled by a 'practitioner'; to correct anomalies in curricula requiring several different skills for the same speciality; and to change the method of assignment of VUZ graduates when the specialization is not taken into consideration.

In July 1979 the Central Committee of the CPSU and the Council of Ministers of the USSR adopted a resolution on "The subsequent development of higher education and improvement in the quality of specialist training", in which it was proposed, in particular, "to organize an earlier distribution - one to three years before the end of their studies (i.e. "the specialists' studies" - author's note) with the consecutive elaboration of the Five-Year plans of placement, and to bring the specifications of these plans to the notice of both the enterprises and the VUZ". The motive behind this is to better relate the training of highly-qualified manpower with the needs of the economy - no longer its overall needs, but according to the individual needs of the enterprises and organizations.

How to establish these direct links between the VUZ and the enterprises in such a complicated matter as the choice of a job for a specialist long before the end of his higher studies. On the one hand, the VUZ has to organize their system of education keeping in mind the speciality and requirements of the enterprise for which they must form the specialists. This means a radical transformation of the whole administrative system, a modification of the curriculum and the practical instruction courses, a search for new teaching methods. On the other, the enterprises also have to make considerable efforts, not just in their approach to the institutions of education but also in transforming qualitatively their personnel policy; a well-thought-out system of evaluating medium and long-term quantitative needs is revealed as a most important element, so as to notify what type of specialists will be wanted, and when. The problem is the more complicated in that it requires a mutually advantageous solution. At present, it is a fact that although relations between the VUZ and the enterprises are not of a unilateral nature, the former give more than they receive from the latter.

Two years - since the adoption of the resolution cited above - is a fairly short time in which to solve such a problem, but both sides - VUZ and enterprises - have already amassed a good deal of experience. The starting point is to find a solution on a direct contractual basis to suit both parties, concerning the prerequisite distribution of the specialists, taking as a basis the system of contractual research. Of course such direct contractual relations are not a universal remedy since, as mentioned above, placing a qualified specialist in employment is dependent on various factors. Even so, the experience gained so far has produced positive results, although as yet limited, for a little more time is needed to put all VUZ and enterprises on the same basis. At the moment we are talking only of the experience of a small number of VUZ and enterprises, which has not yet passed into law, and awaits legalization by Act of Parliament.

The positive results of the experience acquired so far can be summarized as follows:

Those higher educational establishments which have started to conclude contracts with enterprises, for the allocation of jobs to young specialists, have found it largely possible to keep the plans and curricula up to the standard of the latest technical ideas introduced into production, to put them into concrete form according to the specific character of the work, and the needs of the "customer", to improve the students' practical courses and to link their studies and diploma projects more closely with the real needs of the enterprise. It is equally important that the students get to know not just the production processes, technological procedures, and details of the work of the enterprise where they will be employed, but also that they enter into the 'atmosphere' of their future workplace, get used to its rhythm and routine, feel a part of the community, much earlier - and following a specific plan, even several years earlier than was previously the case. In short, having established the direct and requisite contact with the enterprise concerning assignment of jobs to future graduates, the higher educational establishment is in a position to make considerable improvements in the training of specialists, in other words to fulfil their main function.

The enterprises also do well out of the arrangement. They have certainty of obtaining the services of specialists that correspond to their needs. They know in advance with whom they will be working, can get to know the person thoroughly, and make the best use of his professional qualifications and special skills. Obviously they must keep constantly abreast of trends in mobility of highly qualified manpower, seriously affected as a result of scientific and technological progress, and must elaborate a detailed personnel policy, based upon accurate - and not approximate - estimates. These fresh possibilities to develop co-operation with the institutions of higher education increase the interest for the enterprise to function at a higher qualitative level. This means expenditure to reinforce the scientific and professional basis, as well as the material and technical installations of the higher educational establishments, with whom they have contractual arrangements.

Thus, the establishment of contracts implies additional obligations for both parties, while offering mutual advantages. Judging by preliminary results, these direct relations between the VUZ and the enterprises contribute to improvement in training of highly qualified manpower and permits greater flexibility in planning as regards the distribution and utilization of young specialists.

4.3 Vocational guidance of VUZ graduates and adjustment to working life

The problem for graduates of adjustment to working life on first arriving in a plant or organization, is not a new one. However, it is now posed in a different manner; more precisely, it is complicated by the effects of the scientific and technological revolution, with production entering a phase of intensive development. There are several causes. First of all, study and work are two distinct types of activity, each with its own special trends and features; the conditions of their development, the professional atmosphere and social environment also differ. This makes it impossible to take into consideration all the differences and particularities, even in an ideal system of personnel training, as it is unlikely that within the walls of a teaching establishment one can learn the work of a production unit, which can only be taught on the shop floor itself.

Secondly, the introduction of new scientific and technological knowledge into curricula inevitably demands time: selection is imperative since it is neither possible nor desirable to introduce all new knowledge. Furthermore, examination and testing is not automatic but a complicated procedure entailing scientific, financial and structural aspects, the solution of which demands a great deal of time.

This adjustment is closely related to the student's vocational guidance. In fact, these aspects cannot be separated: they are elements of a single process - the training and maturity of the specialist, the development of his personality in the work-place - and they coincide also in time. The quality and effectiveness of training, and the use made of the specialists, depends mainly on the level, types and methods of the vocational guidance and occupational adjustment of the graduates.

Increasingly important sociological research, carried out by the Soviet scientists, has singled out some difficulties and problems which the qualified specialist encounters at the beginning of his professional career. First of all, in many cases, these difficulties are related to being unused to work in production, to team work, or in organizing his work, as well as to the change in professional and social milieu after completion of higher educational studies, and starting work in an enterprise or an organization. This is one of the defects in specialist training, and which often causes dissatisfaction on the part of the enterprises. The main task in professional adaptation should focus on the young specialist's introduction and integration into the working socio-professional environment.

The Soviet Union has found two ways of tackling this problem. First, in curricula a larger place is given to the science and practice of personnel management, to the analysis of different situations - typical and non-typical, economic and social - which may arise during working life. Secondly, measures taken to improve training and professional adaptation are modified to take into account the results of sociological research. As mentioned above, the decision as to placement of specialists one to three years before completion of their secondary specialized or higher studies, aims at perfecting their adaptation and increasing the time devoted to this aspect, so that the student can get used to the conditions of his future workplace.

In order that the process of professional adaptation may be effective, a system of compulsory activities is laid down for higher education. Students must follow a practical course of one year in the factory or organization where they will be employed after completion of their studies. This is an important condition and the sine qua non of occupational adjustment. The aim of the course is that young specialists should study in a serious and on-the-job way the duties that they will be called upon to carry out, so as to acquire the necessary experience as regards the organization of the work, and to learn about new professional techniques and achievements.

Overall responsibility for the course rests with the appropriate sectorial ministries to which the enterprises, organizations and educational establishments are responsible.

The standard programme of the practical course is worked out according to industrial activity and approved by the Ministry of Higher and Specialized Secondary Education; the duration (maximum one year) varies according to speciality; there is periodical control of the organization and content of the course, and experience in this respect is generalized.

The enterprises, organizations and educational establishments are invited to:

- organize practical courses for VUZ students, according to a planned programme and individual schedules of training;
- appoint heads for the courses, from amongst their best qualified staff who have proved themselves to be good teachers;
- set up the requisite conditions for conducting the course;
- report to the appropriate ministries on the organization and the results of the course, giving an opinion on the quality of the training for specialists in certain VUZ;
- prepare the annual report on the course, and propose steps for further improvements.

The courses are conducted according to individual programmes, dealing with all the types of work to be accomplished by the young specialists. For example, the programme for all students from engineering faculties includes compulsory courses at a so-called "Young Engineers' School": this is one of the most effective methods of the course. It is a first step in the training of engineering managerial staff, which is in two parts:

- a theoretical part, including a course of [illegible] hours maximum. This theoretical programme is carried out with interruption of work;
- a practical part, comprising work done in the plan itself, carrying out the duties of engineers or technicians under the supervision of the head of the course.

The evaluation of the training course for each young specialist is the subject of very careful study. This is an important stage in the student's professional and social life - on the threshold of his active career. For this evaluation, a special committee is set up within the enterprise, chaired by the director of the establishment or his deputy. Representatives from production units in the factory, and from organizations of the Party Komsomol, trade unions and the Council of young specialists also participate. They study the whole range of questions relative to the execution of the individual programme, solicit the opinion of the young specialist's chief on the quality of his work during the course, on the knowledge and practical experience he has acquired, and his organizational ability, etc. The Committee also studies the proposals and comments made by the student, during the course, on the work of the enterprise.

This wide-ranging discussion gives the Committee a chance to form a definite opinion as to the level of training of the young specialist, and his ability to carry out managerial tasks; and for them to make recommendations for his further improvement, and the most rational use of his services according to qualities displayed.

This very important evaluation on the course is carried out by the plant or organization, in conjunction with the institution of higher education, from which result proposals for further improvement in teaching. The VUZ, with the help of the plant's representatives, arrange conferences, lectures and meetings between the students, so as to exchange experience gained during the course. This work in common, and the co-ordination, enables measures to be taken to change and perfect the type and methods of the course itself, and has as its general aim to improve the training and rational distribution and employment of specialists.

During subsequent years, the graduates together with all specialists; including those that are experienced, must undergo an examination or attestation procedure every three to five years, the reasons for this important test being:

Modern production is ever more demanding of specialists with higher or specialized secondary education. The resolving of complex production problems depends more and more on them. The efficiency of their work must constantly improve, along with their creative initiative, and the updating of their technical and economic knowledge.

The question is, how to stimulate all this? How to know if a specialist is behind in new scientific and technological trends, or whether he has perhaps lost the capacity to keep abreast of the new techniques? Occupational adjustment is now so vital that the specialist's ability to adapt to his work is constantly called in question.

This process of verification is one way of dealing with these questions in Soviet enterprises, establishments and organizations. Its main aim is to decide upon the specialist's aptitude for his work, and to assess the level of his knowledge. It permits the resolution of the problems of selection and distribution of highly qualified personnel, and of their promotion, in a more rational and efficient way.

A guide to the qualifications of officials, engineers and technicians - a 'job description' - is a necessary, practical document for attestation purposes. It is a sample list of duties and their special features, and the qualifications required of the worker. It defines the scope of the work, obligations, rights, and degree of responsibility of each specialist. In the elaboration of functions, such points are taken into account as: intricacy of the work, scope of the activity and management, unusual features, amount of responsibility and degree of independence in the job (work depending directly and strictly on the immediate operation to be carried out, individual work according to a programme, and work based on the general guidelines of the chief but requiring individual initiative as to ways and means of doing the specific task involved).

The job description lays down the level of education necessary (specialized secondary or higher) for the relevant post. In addition, within the framework of the same job, tasks of differing degrees of complexity and type of production may be involved. Variations in the individual qualities of workers, (organizational ability, moral qualities, etc.), differences in creative attitude to work, are also taken into account in the course of the work carried out within the job.

The satisfaction a worker feels on promotion, where his attitude towards the job as a means of earning a living is combined with social appreciation of the work, is a valuable indication. We know that a close correlation exists between promotion and the raising of a worker's salary: according to our sociological research, almost half the specialists consider their promotion to be linked to the improvement of their qualifications.

4.4 Life-long Education

The continuation of studies after the end of the formal teaching cycle is not just a specific feature of the present period. One may say that this has been a constant and wide-spread ambition at all times. What is new in our day is that continuous training has become essential, and is now considered an integral part of life-long education.

In the Soviet Union there is a vast network of facilities for life-long education. Those specialists having gone through higher education (or specialized secondary) and wishing to continue their studies are encouraged to do so. Thanks to governmental decisions, this type of instruction has become compulsory and regular.

In the Soviet Union there are many ways of continuing education, the most common being:

- improvement of qualifications
- retraining courses
- supplementary instruction courses

The system for improvement of qualifications is the most widely developed. It is well known that, in the present scientific and technological revolution, the sum of our knowledge is revised and renewed by 50 per cent every five or seven years. Steps taken to improve qualifications are based on this fact: each specialist is required to undergo retraining once every five years. In other words, thanks to this specially created network, each year, one fifth of the millions of specialists in the USSR bring up to date their knowledge in all branches of the economy, culture, science and education. It is an unrivalled system for improvement of qualifications, and takes the following forms: faculties for improvement of qualifications functioning within the framework of the institutions of higher education; uni-disciplinary and multi-disciplinary institutes; courses within ministries; courses functioning within the enterprises and in the different educational establishments.

Differentiation must be made of training with interruption of work - maximum two months; and training whilst continuing to work, in evening classes - three to six months. Education with interruption of work benefits from the fact that during the whole study period, the specialist is guaranteed an average salary, a place in a student hostel, and paid travelling expenses.

The main, and most widespread way of improving qualifications is that of so-called sectorial training, existing in all the ministries. At the present time, more than 2 million students a year are covered by this system. The teaching is taken care of by 56 sectorial institutes and 82 subsidiaries. Over 400 permanent courses, within production, industrial enterprises and other organizations, carry out such training for directors, engineers and technicians. In addition, the system comprises 63 specialized VUZ faculties of which eleven are for production managers, where future production chiefs and specialists with experience of practical work, carry out their studies.

The Soviet teaching profession, at all levels and in all types of education, also has its own system for the improvement of qualifications, and comprises 120 faculties and institutes. The system functions under the same conditions: each teacher must follow a course every five years, with guaranteed salary and paid travelling expenses.

Recently, in the Soviet Union, a new series of measures for perfecting the sectorial system of qualification improvement were undertaken in order to strengthen contacts with higher education. The aim was to transform the institutes, faculties and courses involved in this improvement into real methodological centres, in order to disseminate information on the achievements of science and technology, and progressive experience in development of production, growth in efficiency, and quality of work in communities and collectives.

An inter-ministerial council for the improvement of qualifications of directors and specialists in the national economy was set up within the Ministry of Higher and Specialized Secondary Education (MINVUZ), in conformity with the above-cited resolution. It has wide powers of co-ordination of the work of the ministries aiming at such improvement. MINVUZ has reinforced control over the content and quality of the educational process, in the sectorial system for qualification improvement, as well as for the publications plan of school literature, and the admission of students. MINVUZ has the statutory right of inspection of the system of improvement of qualifications, to resolve these questions. All these steps strengthen links between higher education and the sectorial system for qualifications improvement. At present, the sectorial ministries draw up a single planning programme of the measures to be taken to improve the qualifications of specialists, taking into account the types and methods of teaching, as well as the professional qualifications.

The system of retraining was started at the beginning of the 1970s in the form of special faculties aiming at retraining highly qualified personnel employed in the new and complex sectors of science and technology, where needs for such specialists must be satisfied immediately and in the quantity required.

Special faculties are created within certain higher educational establishments. In the daytime faculties, instruction lasts a maximum two years with interruption of work, but with a guaranteed salary and a free place in the students' hostel. On completion of these specialized studies, they receive a second diploma.

Those attending these special faculties are mainly engineers, scientific assistants and high-level managerial personnel, having been through higher education and with thorough working experience.

The novelty and high standard of the quality of the material utilized in this retraining is one of the principal features of this type of education in special faculties. The teaching methods help to ensure integration of the theory classes with the students' daily practical activities. The training is highly individualized.

Supplementary instruction is the third type of post-graduate training, which aims at complementing the training of a certain category of specialists lacking up-to-date knowledge in certain scientific and technological fields, to enable them to fulfil their professional functions in an efficient and highly qualified manner. For example, there are faculties for production chiefs to help directors of plants to widen and modernize their knowledge in the economic sciences, or there are mathematics courses for chief engineers.

All the above-mentioned forms of instruction are mutually complementary and are an integral part of Soviet education and training of highly qualified manpower, of their distribution and rational employment. Higher education plays a principal role, in assuring not only the training of such manpower, but also in participating considerably in post-graduate lifelong education.

5. INTENSIVE DEVELOPMENT OF THE ECONOMY AND HIGHER EDUCATIONAL PLANNING

Planning is an active process, susceptible to changes occurring in the phenomenon which is the subject of planning. It is to be expected that qualitative changes in the development of the economy, such as the transition of the Soviet economy to the intensive model of development, could not but have repercussions on the planning of higher education and in turn provoke changes in its aims and methods, thus creating fresh problems to be solved. Planning was bound to react to this radical change. However, this does not mean rejecting out of hand all acquired experience and starting anew. The response of Soviet planning was as follows: first, to make better and more efficient use of existing methods which have already proved their worth, by adapting them to the new circumstances. Secondly, to work out new, improved methods, bearing in mind the problems which have arisen in the course of transition of the economy towards intensive development.

5.1 Co-ordination of higher education and production: balance method

The basic principle of Soviet policy in the field of higher education is that it is necessary to co-ordinate its development with long-term needs of the economy for highly qualified manpower. This is often mistakenly regarded as a limited economic approach, which is why it is necessary to emphasize that it is a question of co-ordination, and not of subordinating all higher education to purely economic needs for highly qualified manpower.

The balance method, worked out by Soviet specialists, has become an essential instrument for this co-ordination, and has been widely used in higher educational planning and also across the whole of the Soviet economy. The method has shown its effectiveness in the past, and even today has lost none of its credibility; on the contrary, it reveals ever greater latent possibilities. To co-ordinate the different elements of the national economy in a single plan means working out a system of quantitative and qualitative indicators, having a close correlation and characterizing both the initial situation (diagnosis) and the expected results (prognosis), i.e. the level of development envisaged, rates, amount, conditions and proportions; this is what the balance method is called upon to deal with.

The balance of work occupies an important place in the system of balances and in particular those directly concerning educational planning and training of highly qualified personnel, such as the recapitulatory balance of manpower, and balances of the placement of young people supplementary needs for workers and specialists, and of the sources required to satisfy these needs. Balances and evaluations are made separately for the whole of the Soviet Union, for each of the Soviet Republics and for large economic regions. They are drawn up for an exercise period and a plan period.

Recapitulatory balance of manpower for the country is distinct from those for the Republics and the regions. The latter show the redistribution of the inter-republican and inter-regional population and their migration from village to town. The balance of regional manpower provides for a more detailed classification of sectors of the national economy, especially the services sector.

The main objective of the recapitulatory balance of manpower for the whole country, as well as for the Republics and the regions, is to ensure full employment and rational use of manpower throughout the Soviet Union, taking into account the scope of production, its distribution and the development of socio-cultural activities. These balances serve equally as a basis for planning and distribution of highly qualified manpower.

The estimated balances concerning the distribution of school leavers of the 8th and 10th classes for different educational establishments and for work, play an important part in educational planning and training of highly qualified manpower. The plan for integration of young people into the economy, and the plan for admission of pupils having completed the 8th class, to the 9th class in secondary schools, and other specialized secondary educational establishments of different types, are drawn up according to these evaluations. In the USSR, as from 1977 an overall plan for the whole territory has become compulsory for entry of school-leavers after the 8th class into the 9th class and into other specialized secondary educational establishments of different types in the Republics and the regions. This enables solutions to be found for the problems relative to planning of development in the different types of education (secondary school, vocational and technical, Technicum and VUZ). It also avoids a too narrow sectorial approach, leading to the isolation of one sector from another.

The balances of placement of young people show how school-leavers from the 8th and 10th years of general school are streamed to enter different types of educational establishments, and determine the number to be directed towards the national economy having the same level of instruction. With the help of this method, on the one hand, the problem of their integration into social production is solved, and, on the other, plans are co-ordinated for their admission to educational establishments according to the economy's needs for workers of different levels of qualification, and to the demands of the socio-cultural progress of the society.

The system of working out of general manpower balances for the country dates from the 1930s, but has since undergone a wide quantitative and qualitative evolution.

Firstly, in the 1960s, acquired experience led to the preparation of balances of manpower for the Soviet Republics as well as for the large cities initially, for Moscow and Leningrad. In recent years, manpower balances have been drawn up for all regions of the country. Until not long ago, recapitulatory balances of manpower were elaborated for one year; but as from 1980, long-term balances are prepared (for periods of 5 and 10 years, the coefficients being presented for each year).

The use of mathematical economic methods in recapitulatory balance for manpower for the whole of the USSR has also helped to perfect this balance.

The use of a mathematical model of qualified personnel based on the balance of intersectorial exchanges, which ensures the correlation of manpower needs (according to job, speciality and level of instruction), growth rates and structural changes in the national economy, is another means of perfecting the balances of manpower. Optimal planning of education and training of highly-qualified personnel in present conditions is unthinkable without elaboration of mathematical models and their continual improvement, aiming at bringing together the complex elements of the process mentioned above, i.e. the training of creative personnel for all sectors of the economy.

It must nevertheless be remembered that the elements of the process and their correlations have become so complicated and are so very intermingled, that great difficulties exist in elaborating such models.

Planning of higher education demands a many-sided approach. It is only in this way that an equilibrium can be ensured between the social demand for education, and the national interests. The balance method, makes feasible the co-ordination of, needs for specialists with the balance of manpower, and renders possible the process of overall higher educational planning reconciling interior and exterior elements which combine in the economy, and its various sectors.

5.2. Revision of the aims and methods of higher educational planning

Soviet policy in the field of higher education, at the present stage of the country's development, has set itself new aims, taking account of past experience in resolving the problems that arise and in overcoming difficulties. As the most important instrument in this respect, planning obviously could not remain static. It was necessary to perfect its mechanisms, improve methods and evolve new approaches and new models.

Under these changing circumstances, the aims of higher educational planning may be summarized as follows:

- Maximum satisfaction of the needs of the national economy, and all its sectors, for highly qualified specialists, taking into consideration the increased social demand of the population for higher education in a developed socialist society;
- Rational distribution and effective utilization of specialists: the establishment of a "feed-back" between the economy and higher education;
- Improvement of the quality of education and definition of detailed forms of training;
- Definition of the regional links between higher education and specialized secondary instruction, according to groups of specializations and the specialities themselves;
- Maintenance, for each speciality, of the most rational equilibrium between the types of instruction (full-time, evening classes, and correspondence courses) bearing in mind the particularities of the educational process, and the economic sectors for which the specialists are trained;
- Installation of schools on a rational territorial basis, bearing in mind the distribution of the country's productive workforce, as well as socio-demographic factors;
- Ensuring appropriate ratios between the number of students and that of the pedagogical and scientific personnel, between growth rates of investment in development of higher education and the numbers of VUZ students.

It is true that some of these aims have already appeared on the agenda of higher educational planning in the past. For example, the equitable distribution of higher educational establishments has always been the subject of concern. But today, the situation has changed, and so has geographical distribution.
In addition, the problem of national, highly-qualified personnel is less urgent, having on the whole, been resolved. In other words, the former difficulties have taken a new angle, which must be taken into consideration in the planning system, in the elaboration of the indices of the plan, and in its methodological approach. For example, one of the requirements of Soviet higher educational planning is co-ordination of the factors of its development with other sectors of the economic plan. Today, there are changes in the choice of indices and in their importance. Thus the brief phase, "To have highly qualified personnel is the deciding factor" was formerly the central idea of planning policy. Today, it is complemented by the demand for higher quality in the training of specialists and for their effective utilization.

The problem of co-ordination of development factors in higher education with those of the national economy represents in itself considerable methodological and technical difficulties, due to the differences in planning for each of these phenomena. Firstly, higher education is by definition, and inevitably must be, the subject of long-term planning, since the training of specialists, and of the teaching profession, as well as the setting-up of the material and technical base for higher education, all take long periods of time.

Secondly, higher educational planning is influenced by scientific, technological and social progress to a greater extent than economic planning.

Higher educational planning has become an increasingly complex process, which can be noted by the fact that former planning methods have decreased in efficiency, and are now inadequate.

Soviet scientists and specialists have conferred widely as to the means of improving the efficiency and precision of planning methods. Research is continuing in different directions and covers the various planning phases. The starting-point of this research is an in-depth study of the specific nature of higher education for planning purposes, and consists of attributing an extremely important rôle to qualitative factors (quality of the system of education and training, capacity and skills of the teaching profession, etc.) which cannot easily be measured quantitatively.

In Soviet research, and in the practical activities of higher educational planning organs, special attention is paid to forecasting, of which the two most important criteria are: the needs for highly qualified manpower in the national economy, and the number of students to be admitted to educational establishments.

Certain methods aim at finding a solution on the macro-level. For example, the working hypothesis of one such method is the stability of the ratio between the number of specialists working in the national economy, and the volume of the final product per person. The analysis of a set of data for the twenty-year period 1951-1970, according to the first criterion, and the comparison of results obtained by regression analysis of the data according to the second criterion, have confirmed the high degree of that stability. This correlation was the basis for evaluations of changes in the needs for specialists in the economy for an estimated period, and for each year of that period. The results facilitated calculation of the number of specialists trained by the VUZ.

Another method aims at establishing the dependency existing between the number of specialists and per capita income. Comparison of the results obtained by this method with those of the first method, revealed very similar figures.

Other research has permitted an in-depth appraisal of general indices of this type. If growth rates of national income for a certain period, and estimates of needs for specialists in the economy are known, the figures show the following relation: 80%

of VUZ graduates represent a general increase in the number of specialists, and the remaining 20% serve as renewal; a growth of 0.93% in the number of specialists with higher education working in the economy corresponds to a rise of 1% of national income.

It is obvious that analysis cannot be limited to macro-models which only give a general orientation. The level of the next type of model, currently used in higher educational planning, is the determination of the dynamic of the needs for specialists at the level of large groups of specializations, and within each group. The sectorial principle (by economic branch) is complemented by the geographical principle - elaboration of forecasts of needs according to economic region. Let us emphasize, finally, an innovation such as the attempt to elaborate the analysis of needs on a minutely detailed basis of construction of the long-term multivariant model of the specialist.

The present work does not aim at studying in detail all the different models already used in Soviet higher educational planning, nor those still at the experimental and discussion stage. It may however be added that the unpredictable nature of scientific and technological progress, which is not always easy to foresee, means that we cannot completely ignore the probabilities of the forecasts of needs for specialists in the economy. Nevertheless, Soviet research on forecasting has shown considerable effectiveness which, according to certain Soviet specialists, outstrips expenditure on such research by 50%.

Efforts made to improve the efficiency and accuracy of planning of higher educational development, to develop social production and the training of highly qualified manpower in a more balanced way are as much justified as extremely necessary, if one takes into consideration all that has been said above; i.e. the increasingly wide boundaries of the "industry" of training of highly qualified manpower, as well as the growing rôle of specialists in scientific and technological progress. To give but one example: a hypothesis fairly close to reality - approximately 50% of total economic output from the practical application of certain scientific and technical inventions is due to specialists with a higher educational background. It is obvious that even a very slight reduction of the gap between planned coefficients in relation to real needs can have quite considerable results.

A further remark must be made in this respect. At a time when the different economic sectors in the USSR were short of specialists, the disparity in their training was less apparent and its negative influence passed unnoticed. The enterprises, suffering from shortages of highly qualified personnel, offered work to any specialist, regardless of his specialization, acting on the principle that any specialist would be more useful than a worker having had no specialized training at all. Today, with the expansion in specialized training, and with the needs of the economy almost satisfied by young graduates, the significance of errors in the elaboration of the plan is considerably more important. In cases where the number of specialists in one or another special skill exceeds the planned needs, there is less room for flexibility in finding them jobs fitting their specialization and qualifications.

When speaking of revising the tasks and methods of higher educational planning, we cannot ignore a question as important as the drawing up of the plan, since the permanent democratization of this process involves practically all the personnel working in that sphere of activity. The higher educational establishments also participate in the planning of specialist training. Each institution draws up a preliminary draft plan containing proposals on the possible training of specialists in that establishment, and on the organization of training in new specializations. The teaching profession, the social organizations, and the students are all invited to take part in the drafting of this plan, which is then submitted for discussion by the whole of the VUZ, students included.

The Council of Higher Education, set up within the Ministry of Higher and Specialized Secondary Education, and the regional councils of VUZ Rectors of the great university centres of the country, work actively on questions relative to long-term planning of training of specialists, their distribution and rational employment.

In the Soviet Union, prime importance is accorded to the perfecting of the planning mechanism which remains a regular priority at the highest level of the economic policy of the State. In this respect, a recent important document is the Resolution of the Central Committee of the CPSU and of the Council of Ministers of the USSR, adopted in 1978, dealing with "The improvement of planning and strengthening of the influence of the economic mechanism on the growth in efficiency of production and the quality of work". The Resolution established the following procedures for long-term and current plans of socio-economic development:

- a complex programme of scientific and technological progress (by five-year period) is drawn up for twenty years, and submitted to government two years before the beginning of the following five-year period. Every 5 years the programmes are revised and made more precise, and a new programme drawn up for future five-year periods;
- a draft of the main options of economic and social development of the country (by five-year period) is foreseen for 10 years. For the first five-year plan the indices are elaborated yearly, for the second, they are determined for the last year of the five-year plan period. Every five years the appropriate revisions are made in the main options, and then drawn up for the new five-year plan period. As a general rule, the main options draft is submitted to government 18 months before the beginning of the subsequent plan period.
- control figures, according to the principal indices and economic norms, are elaborated yearly for each subsequent five-year plan period; they are submitted to the Ministry a year before the

beginning of the next plan period, and the latter makes known the control figures to the production unions and to the enterprises, not later than a month after receiving them from USSR GOSPLAN. The unions and enterprises propose their five-year plans which serve as a basis for the drawing-up of draft five-year plans (with selected yearly aims) at the level of a Ministry of a Soviet Republic. USSR GOSPLAN, taking into consideration the draft plans, draws up a five-year State Plan for economic and social development for the USSR (with selected yearly aims) and submits it to government five months before the start of the subsequent plan-period.

The importance of the above-cited Resolution lies not only in the fact that it brings greater accuracy to the planning of the national economy, including higher education, but also, no less important, in what is behind the newly proposed planning procedure.

First, the Resolution recommends a close relation between the long, medium and short-term forecasts, which must be taken into account in drawing up development plans. Each new plan, keeping view results obtained during the preceding plan-period, is considered as a basis for the subsequent period, a sort of bridge to the next plan. This type of bridging gives an overall unit to the socio-economic development process. As a result, the ongoing character of this process finds practical expression in the actual planning, in the plans themselves.

Secondly, the Resolution is based on the assumption that many development factors do not take effect or produce results immediately, or even during the period considered as medium-term but often several years afterwards: even ten or fifteen years later. This applies, for instance, to higher education. In such cases, a short- or medium-term planning approach is not suitable. This is why short- and medium-term planning is now integrated into long-term development plans.

Thirdly, Soviet planning is not dogmatic, and the plans are not rigid, monolithic or unchangeable. A Soviet plan, after approval and having been passed by law, must be carried out without fail, which leads certain outside observers to refer to the inflexibility of plans, or incapacity to react in an operational manner to changed circumstances, etc. These assumptions are based either on merely superficial knowledge of the question or even on a biased analysis. Indeed, in the new planning procedures, the law sanctions as not only necessary but compulsory to incorporate in the plans changes or precisions, in line with the evolution of conditions and factors of development.

Such an approach to the question is quite clear. It is of course essential to take into consideration that certain procedures in specialist training (in particular choice of a specialization, the question of migration, etc.) have their own uncertainties. It is difficult, if not impossible, to estimate such factors in a precise and accurate fashion in planning. This is one of the reasons why, however perfected planning methods for training, placement and utilization of specialists may be, a lack of co-ordination with the needs of the economy cannot always be ruled out. Sometimes, divergences between real indicates from those of the plan are revealed. In short, there is a constant necessity for exactitude, and regularization of the plan by means of special statutory measures.

5.3 Determination of the needs for specialists - principal link in higher educational planning

The estimation of the national economy's needs for specialists, which serves as a basis for determining the number of students to be admitted to the VUZ for each forecasts period, has a significant place in planning of higher education in the USSR. It is linked on the one hand with the State's obligation to attribute a post to graduates of VUZ and Technicum in accordance with their training. On the other, it is important that each enterprise, establishment or organization should obtain the specialists they require. Soviet state policy is one of full employment, a non-acceptance of unemployment. So, planning of specialist training must be extremely precise and well balanced. For practical planning purposes, training of highly qualified manpower - especially full time training - must correspond adequately to the needs for specialists in the economy.

The drawing-up of forecasts of needs for specialists, i.e. definition of the number of category which the economy needs at a given period, demands a detailed evaluation of the factors that determine such needs as far as the numbers and types of specialists with higher or secondary training are concerned.

The estimates of specialized manpower needs, necessary for drawing up annual and five-year plans, are made by the enterprises establishments, and then by the ministries, taking into account the many different actual conditions. Needs are determined for each one of the 400 specialities in which training is given in the VUZ.

In practice, to fix these needs, estimates are based on so-called overall needs, and on supplementary needs, two important aspects of Soviet planning.

The overall needs are the total number of specialists required by an enterprise, a production unit, or a branch, to carry out the forecast volume of work. The supplementary requirement is the difference between the overall need and the actual number of specialists at the beginning of the planner period. Supplementary needs have a special rôle in the educational planning and placement of specialists, since it is on this basis that the increase in specialists training is decid

The estimates for supplementary needs of specialists include the following elements:

- number of specialists necessary for making the increase in the number of posts requiring higher or specialized secondary education, as a result of future extension of production;
- number of specialists necessary to replace natural wastage;
- number of specialists necessary for partial replacement of "practitioners" i.e. those without specialized training but filling specialists' jobs.

Determining the needs to cover increases in the number of posts to be filled by specialists is the most difficult part of such calculations, requiring considerable effort. This is done taking as a base the development plans of an enterprise, a production unit, a branch of a territory. At the same time, the required number of specialists is determined - either due to the creation of new enterprises, scientific institutions, research departments and project offices, or due to the technical and technological evolution in production, management methods, etc. In the non-productive sectors of the national economy, the increase in the number of posts is defined by population growth, by development and improvement in the educational system, public health, services, etc.

Account must be taken of the fact that orientation of young people towards all sorts of professional activities is changing. Thus, in the 1970s the proportion of young people directed towards higher technical education diminished; amongst the graduates of higher educational establishments, those who will accept a limitation of their professional activity to tasks of a simple nature are much less numerous.

Recent sociological research reveals changes in the reasons for migration of skilled workers. Until 1965, the desire for improved material conditions or a better salary, were the principal reasons for such migration. The figures show:

From 1953 to 1957 : 46.6 %
From 1958 to 1962 : 35.6 %
From 1968 to 1969 : 11.7 %
From 1972 to 1975 : 5.7 %

Reasons such as the possibility of continuing studies, obtaining a useful specialization, interesting cultural and leisure activities, are increasingly important in rural youth's system of values.

It may be asked, what methods are used by Soviet planners to determine their needs for specialists? To what degree is scientific and technological progress taken into consideration? How has Soviet experience evolved in this extremely complex field of planning?

When Soviet planning was in its primary stage, scientifically-based criteria and norms for establishing the needs of the economy for specialists did not exist and had to be developed. At that time the method of gathering the necessary information was fairly simple and was limited to asking the "consumers" how many and what type of specialists were required per year, bearing in mind the adopted development plan; necessary data as to needs for highly-qualified personnel were based on this information.

Since the 1960s the efforts of Soviet experts have contributed to the elaboration of two methods for determining needs of highly qualified manpower in the economy, i.e. of saturation and of nomenclature of jobs. The planning organs use these methods today, although they are not as yet perfect, having certain shortcomings which will be discussed later on.

The International Institute for Educational Planning (IIEP) of Unesco has already issued publications dealing with the subject of Soviet higher educational planning.[1] Here we will limit ourselves to a brief résumé, while those interested in further reading may consult the publications cited.

The saturation norm concerns the number of specialists in the total personnel of an economic sector, unit of production, or enterprise; it is the number of specialists per 1,000 workers.

The nomenclature is the list of posts to be filled by qualified specialists; the list of all the different jobs, established in each enterprise or establishment, where qualified specialists are required, according to the type and complexity of the work.

For each job, the type of specialization required is laid down. Requirements are calculated for each sector, production unit, enterprise and establishment, for periods of five and ten years, with yearly revision of the indices.

Of recent years, norms and other scientifically-based criteria of the work of specialists play a big part in the estimation of needs for such highly qualified manpower. A great deal of work goes into the development of such methods, which link closely the norms of saturation in specialists with the principal technico-economic indices of development in different sectors of the national economy.

The fixing of the saturation norm takes into account the principal factors influencing the need for highly-qualified manpower and the level of saturation in production of specialists. On the one hand, there are the factors which increase the requirements and the saturation level of an enterprise, such as increase in production(opening of new factories or extension of existing ones), influence of scientific and technical progress (mechanization and automation of production, introduction of new types of raw materials and of advanced technology and new technological procedures, use of the new procedures, production of higher quality, development of scientific research, work on construction projects, extension of experimentation, etc.). On the other hand, there are factors which lessen requirements for highly qualified manpower, e.g. improvements in management systems and organization of production, (extension or suppression of small production units, introduction of new management structures in small enterprises, enlargement of small factories and plants, etc.,), changing of work norms of specialists, introduction of scientific organization in the work of directors, engineerings and technicians mechanization of management and engineering work, and increase in its efficiency, improvement in placement and correct utilization of specialists, freeing specialists from those jobs not requiring higher or specialized secondary education.

---

[1] Educational planning in the USSR, Unesco, IIEP, Paris, 1967; The educational system in the Soviet Union: planning and recent development, Unesco, IIEP, Paris, 1981.

The profusion and the contradictory efforts these factors have on the saturation rate of specialists make it essential to establish the co-efficient for the planner period according to evaluations by specialist-experts in these fields. To this end, special precision methods using previously gathered information are employed.

As a general rule, the method of expert evaluation is used in conjunction with that of the grouping of enterprises, and choice of a typical enterprise (see Table 8). Here, particular attention is paid to the following phases in evaluating the saturation norm for specialists:

- regrouping of enterprises of the same sector;
- choice of a typical enterprise in each group;
- drawing up of an alignment chart or graph on how the saturation rate is influenced by factors as mentioned above.

The enterprises are grouped according to analysis of factors influencing the volume of production, technical level, output achieved, level of organization of the work and management. The choice of such factors for the grouping of enterprises in each sector is made, taking into account their specific conditions. For example, in machine-tool construction, the grouping is carried out according to the technical level of production, the type of organization of the work, and the complexity of the finished product(s).

The laying-down of common criteria is indispensable in the grouping of enterprises. In this way, they are regrouped into sub-groups according to management structure and other criteria. In choosing a typical enterprise in each group the following is taken into consideration:

- Homogeneity of similarity of production for the same group of enterprises;

Table 8. Level of saturation of industrial enterprises in engineers and technicians according to the complexity and quality of production (number of engineers and technicians per 1000 industrial workers)

Complexity of production	Category 'superior quality' predominant	Category 'first quality' predominant	Category 'second quality' predominant
Individual production and small series production			
Specially complicated	189	176	141
Complicated and simple	145	146	112
Production in series			
Specially complicated	165	141	129
Complicated and simple	140	124	123
Mass production and in large series			
Specially complicated	118	108	91
Complicated and simple	115	100	85

- Selection of the most progressive enterprises according to work criteria, and functioning better than the others in the group as to organization of work, of production, and of management. The choice of a typical enterprise is of primary importance in fixing the planned rate of saturation of the group of enterprises. A detailed breakdown of the distribution and utilization of specialists is carried out in the enterprise chosen as a model. Its structure is taken as the yardstick for all the others in the group.

In spite of constant changing and revision, methods for measuring the economy's needs for specialists are still not perfect. This applies to evaluation of global needs, as well as needs for certain specialities, and especially those for engineers, economists, and agricultural experts.

Analyses made by Soviet specialists and scientists have revealed various errors and gaps in methods of evaluation, and thus research has been directed towards perfecting them. We might mention, for example, that not enough attention is paid to development perspectives in the economic sectors: this has led to a wide gap between needs for specialists established by the ministries of the industrial branches for each year of the five-year plan, and needs fixed by the plan for the current year. We know that, to draw up the plan for specialist training, amongst others for entry to the VUZ, information on estimated needs must be available approximately 5 years before the period to be planned. Thus, to draw up the specialist training plan for 1975-1980, estimation on requirements for 1981-1985 were needed.

Another problem which has not yet been solved completely is the territorial distribution of graduates from higher and specialized secondary educational establishments. Obviously, this has repercussions on the degree of precision of estimates at the level of inter-republican distribution of qualified specialists.

However, the greatest difficulty comes from errors in evaluation based on the nomenclature of posts. The fact is that in several enterprises the nomenclature differs considerably from their real needs. As the enterprise is keen to have as many specialists as possible, they often over-state the numbers really needed. As a result, in 1977, in the nomenclature of jobs, the number of engineers was appreciably in excess of that of technicians having specialized secondary education for the whole of the country. Therefore, the establishment of a scientific basis to fix the needs for specialists in the national economy is an essential tool for perfecting the planification of their training and rational distribution and employment. For this reason, the Soviet Union considers research in this field to be eminently important.

6. CONCLUSIONS

In offering the present work, the authors were guided by the idea that the study of different countries' experience has an immense and twofold interest for all peoples. First, certain positive elements of one country's experience may be applied by others bearing in mind of course adaptability to local conditions. This is the case for many countries around the world, and there are many examples. The Soviet people have noted with satisfaction that the concept of planning, and many other new ways of solving educational problems, which were tried out successfully in the Soviet Union for the first time and in which a vast experience has been built up, are now used in other countries.

Secondly, studying other countries' experiences broadens and deepens our understanding of a particular problem, enabling us to avoid the mistakes made by those countries. This is equally important for those who are just beginning to create a new society, a new modern and independent economy, and who encounter so many obstacles and difficulties on their route.

Concerning the Soviet experience, in this section of our work we would first of all like to draw up a general "balance sheet" of problems which are widely discussed on the international and national plane, and which probably are the most interesting for other countries.

The philosophical conception of educational development has always had first priority in the policy of the Soviet Union, from the beginning of its existence. Thus priority has never been questioned, even in the most difficult periods. The people's education has always been, and will remain, one of the principles of Soviet strategy for socio-economic, scientific, technological and cultural progress, because society itself, in the framework of a socialist state, is considered in its very functioning to be a permanent source of lifelong education.

At the present time, in several countries that are going through economic difficulties, attempts are being made to give less importance to education and also to infer that it is possible and even necessary to cancel the priority which it enjoyed in the 1960s and 1970s. The argument is put forward that education has become a less efficacious factor and that it would be more rational to invest capital in other fields, etc.

The Soviet Union's own experience leads it to refute this argument. In the USSR education is not regarded as being in competition as a national activity. So the question of the efficacity of education does not arise in the comparative sense, i.e. in comparisons of efficiency of different factors. In the present conditions of the scientific and technological revolution, as education has an ever-continuing character, it must equally enjoy continuing permanent priority. There has been no interruption, as for example in the production of motor cars, which today may be stopped or reduced, and tomorrow taken up again and intensified.

In the Soviet conception, the "urgent" character of education does not flow only from the nature of education itself; according to this conception, education is not only one of the main factors of development but also a condition for achieving this development, just as it is a question of instruction for all the people and not just for an élite.

The Soviet experience is proof not only of the supremely vital rôle that education plays in the development of society; it lays stress on the particular importance of education in countries and societies going through the period of reorganization, of transition from one type of society to another, of the replacement of one model of development by another. Such a transition intimates clearly the need to create a new educational system to replace the old one, which had functioned under quite different conditions. The Soviet model of education necessitated a rupture with the principles, aims and content of the pre-revolutionary system. It was based on the radically new principles of a socialist society. This does not, of course, mean a break with the culture of the peoples of Russia and with the moral values built up throughout many centuries. The break was with the old Tsarist school which was unable to respond to the spirit of the new society.

It seems to us that this aspect of the transitory period in the evolution of the educational system is of prime importance for developing countries. In actual fact, the abolition of the colonial régimes was nothing less than the will of the peoples thus liberated to build a new society, breaking with the systems of the colonial era. Obviously the educational systems imposed in the past could not remain unchanged. They were in conflict with the new atmosphere, the new conditions and development aims, and were thus unable to meet the needs of a post-colonial society.

For example, what is one of the fundamental reasons for the 'brain drain' from the Third World countries to the developed capitalist countries? Is it not the fact that the universities set up during the colonial era were a mirror-image of the régime of those days, and often retained the former rules of conduct? Even today, many of them cut off from the aims and interests of the new society, still train specialists who either do not understand the objectives of a post-colonial independent society, or are guided by motives which have nothing in common with such aims, and who consequently are swept into the migratory current of the 'brain drain'. Certain unprogressive trends and certain difficulties in the educational field have been noticed in developing countries, which may be explained for the most part by the fact that, to a certain extent, their educational systems still bear traces of the former colonial régime.

The Soviet experience discussed above relates to the educational system as a whole, but particularly to higher education and the training of high-level manpower. It may be relevant in this respect to point out another special feature: the problems of higher education in the USSR are not dealt with separately from other levels of education. Recently, in several countries - including developing countries - there has been much discussion as to which level should have priority amongst either primary, vocational and technical, or training of middle-rank personnel. In other words, in the early period following independence, should so much of a country's attention be concentrated on higher education? Do today's priorities in the educational field need reviewing? In our opinion, although such questions undoubtedly arise from real difficulties in these countries, many of them are in fact artificial.

Actually, the educational system might be described as a whole in which the components are closely linked to each other. The development of each or any of these components is part and parcel of the others. One component must not have its own predominant development if, at the same time, the other parts progress more slowly. The approach cannot be favourable as a whole if priority is given to one level of teaching rather than to another, and development of other levels is left to be provided for later on.

The Soviet experience in higher education is very relevant in this respect. The problem of higher education and training of qualified manpower during the early years of the existence of the Soviet state was not confined only to the absence of an adequate material and technical basis and sufficient teaching personnel, but also to the scarcity of people having attained the educational level necessary to continue their studies in a higher educational establishment.

This problem was tackled by a series of measures destined to eradicate illiteracy, to introduce compulsory primary education, and to encourage the development of secondary schooling. In other words, all levels of teaching were given equal priority and the new school was created as a single whole, based on socialist principles. The different degrees of educational level were created at the same time, and considered as inseparable. As a result, discussions were not centred on which level should be advantaged when choosing those able to contribute the most to educational development: the Soviet approach was quite different. The basic idea was that education can only contribute to the construction of a socialist society if, as a result of common efforts at all levels and degrees of teaching, the whole system is harmonious.

This general idea was preserved intact in the course of the years as the Soviet Union developed, although circumstances and methods have altered. For example, the fact that higher educational development was stabilised on the quantitative plane during the 1970s, as was shown in Chapter II above, did not at all mean that this level of education lost its primary rôle in development. In the same way, although the problem of training a sufficient number of people who could continue their studies in higher education was resolved - the country had succeeded splendidly in universalising compulsory general secondary education - this did not in any way lessen the importance of strengthening relations between higher education and the secondary school. All these questions remained in the forefront, but were dealt with and ultimately resolved in a different context against the background of the scientific and technological revolution, with the country going over to intensive development and qualitative aspects taking the centre of the stage.

Throughout the development of the Soviet higher educational system, a central place was given to its links with the needs of the economy, with production, factories, establishments and organizations, in a word, with the "consumers". We all know that this problem is becoming more and more vital for developing countries. The analysis attempted in this study, of the forms and methods of linking the higher educational system with production, of their evolution, the results obtained and problems still unresolved, enables us to draw the important conclusion that such links are indispensable to the efficacity of the two "partners" - education and the national economy. It is equally essential to emphasize that the efficacity itself depends on the "spirit" of each partner, on the degree of their involvement in common action in the field of specialist training. It depends also on the existence of a permanent and responsible chain, stretching in both directions - from the secondary school (and not only from the higher educational establishments) towards the enterprise and vice versa.

It is emphasized in this study that the creation of such a chain of correlation between education and production is a complicated affair, demanding considerable and sustained effort over long periods. In the Soviet Union this has required initiative on the part of the enterprises and educational establishments, as well as measures at the level of State policy. The intervention of the State has often led to the adoption of special resolutions, thanks to which relations created on local initiative were legalised, and thus stimulating and disseminating positive experience throughout the country. This experience proves that, depending on certain conditions, where links between enterprises and scholastic establishments were formed and strengthened, both the quality of teaching and the efficiency of the specialist's contribution to production improved.

A study of this problem shows that, in the Soviet Union, the links between higher educational establishments and professional enterprises and other organizations are continuously intensifying and broadening. The authors feel that it is a premise of socio-economic development that must be taken seriously into account in a down-to-earth policy, and would like here to make the following remark. Orientation towards strengthening links between higher education and production in no way means sacrificing the former to the interests and aims of the latter, as is sometimes assumed by advocates of the autonomy and independence of the university, and by those favouring the so-called "manpower approach".

The long route covered by the Soviet educational system, described in the present study, witnesses to the fact that the social and economic strains in Soviet policy are closely intermingled. These two elements are never separated one from another, and there has never been any question of subordinating one to the other. The development of the Soviet educational system is a single indivisible process founded upon the need to satisfy all the social needs of the population. Actual policy shows that the targets for constant improvement of the educational level of the population, i.e. one of its social needs, were gradually achieved : first, compulsory primary education, then incomplete secondary, and, at the end of the 1970s, as stated above, the USSR attained an important, exclusively social objective: the universalization of compulsory general secondary education. Parallel with this movement, of a principally social character, Soviet policy in the field of national education worked towards meeting the needs of the economy as far as manpower was concerned - both workers and specialists.

As regards higher education, there is another specific aspect to its development. For a very long time, the social need at this level was not contradictory but, on the contrary, went hand-in-hand with the economy's need for specialists; the relatively small number of graduates from higher education at that time proves this. Under present conditions, since the advent of general secondary education in the Soviet Union, the rôle of the social needs of the population has increased considerably in the development of higher education. In some parts of the country, development depended more on social requirements than on the economy's needs for specialists; and so one now sees a certain variation in the high-level manpower in different economic sectors in certain regions. This has led to difficulties in distribution and correct employment of graduates in accordance with their special skills and qualifications.

The question of the relation between the social need of the population for higher education, and the economy's need for specialists, was never raised in the early days of Soviet development. In any case, at that point there was no problem and no one worried about special measures. But, with the arrival of the scientific and technological revolution, the problem has come up for priority attention at the highest levels of educational development in the USSR.

In the ideal model, of course, there would be no discrepancies between social needs and the economy's demands, but in everyday life, such contradictions are inevitable. The aim is to actively influence trends of correlation between social and economic factors in higher educational development. Among the various measures and methods proposed to help to solve this problem, planning has an exceptional rôle.

The authors' analysis of higher educational planning, training and employment of qualified specialists, has revealed a whole set of new trends, problems and difficulties in the Soviet Union. At the same time, it has enabled the authors during their research to set out some suggestions and practical recommendations with a view to perfecting the methods of this planning.

First of all, the transition of higher education towards intensive development is a new qualitative phenomenon and has made essential the radical overhaul of planning methods. Thus, during the survey, it was found that many enterprises and establishments use out-of-date methods to forecast their needs for specialists, basing the estimates on a level of production obtained, which is often confused with data on present but obsolete nomenclature of jobs. In other words, technological and economic factors are not sufficiently taken into account, which leads to inaccuracies in evaluation : needs for graduates are over-estimated in some specialities and under-estimated in others. Such inaccuracies have repercussions particularly on needs for new and important branches of the economy. Difficulties can also arise not due to a lack of trained and necessary specialists responsible for scientific and technological progress, but because mistakes in estimates were made at the time the graduate was placed in employment. This comes as much from objective reasons, which do not permit the evaluation of certain phenomena, as from the use of obsolete methods the efficiency of which had been more or less acceptable in the past, but no longer match up to the circumstances of intensive development.

Secondly, the intensive development model of the economy and of higher education in the Soviet Union raises important problems, both at Ministerial level and in the enterprises and higher educational establishments, relative to the employment of qualified specialists and of their rational utilization. Sociological surveys carried out during our research have shown that, in certain cases, specialists have not always been utilized in accordance with their special skills and qualifications. So what must be done in order to ensure that each graduate from a higher educational establishment holds a job in the enterprise where he will be of most use, where his knowledge and skills will be utilized to the maximum, and where his individual interests will be engaged to the full? This is a question now widely discussed at all levels in the Soviet Union.

Thirdly, in order to perfect Soviet higher educational planning, training, and the placement of graduates in employment, efforts are directed particularly towards the elaboration of norm-indices which make it possible to determine factors of scientific and technical progress at the highest level. It is recognized that this is one of the most complicated problems of planning and forecasting of specialist requirements, and several aspects of this problem remain unsolved. There are however, means of evaluating the factors mentioned, for example with the help of regression coefficients for several factors, or the method of grouping of enterprises, using the technico-economic indices of the functioning of these firms. Scientific and technical forecasts and long-term development plans of the economic sectors should become an essential premise for estimating specialist needs, since these estimates are directed towards the future requirements of the different branches of the national economy.

Fourthly, it should be emphasized that the active rôle of higher education is increasing appreciably today so as to obtain the right balance between higher education and the national economy. This concerns among others such spheres of activity as: revision of the list of specialists and current special skills, periodical revision of the content of curricula, perfecting of different types of educational organization, and links between the VUZ and production, development of lifelong education, and of the system to improve the qualifications of specialists working in the national economy.

The active rôle of higher education in the co-ordination of specialist training with production is apparent in the setting-up of different types of co-operation with the VUZ and in the development of direct contacts between higher educational establishments on the one hand and industrial plants and scientific organizations on the other, to cope with problems of student education, of placement and utilization of young specialists. The present phase of Soviet development is characterized by the strengthening of correlations between all the links in the educational chain, and especially those between worker-training and the development of higher education; as also by the increase of dependence on society's possibilities of supplying the human resources, i.e. the necessary manpower for specialist requirements.

As we have already pointed out, the manpower situation in the Soviet Union worsened due to certain demographical consequences of the War. Therefore, it is particularly important to improve the technique of balance as to the placement of young people, whether on completing secondary education they should continue their studies in different educational establishments or go directly into production work. This has given rise to an increase in the rôle of vocational education and guidance for young people, as essential tools for one of the aims of planning: to reconcile the individual interests of young men and girls with the requirements of the economy and of society.

These then are the main conclusions which the authors wish to emphasize in this final part of the work, and which will perhaps give the reader a better understanding of the special features of Soviet experience in higher educational development, taking account of scientific and technological progress and the Soviet economy's need for specialists.

Part II. Higher education and employment in the Federal Republic of Germany

CONTENTS

CHAPTER 1. Higher education and the labour market
by U. Teichler and B.C. Sanyal 89

1. The education and the employment systems: structures and quantitative development 89
2. Characteristics of higher education and employment in the Federal Republic of Germany 111
3. Changing issues of the political debate on the relationship between higher education and employment 117
4. Requirement forecasts and research on higher education and employment 133
5. "Qualitative" relationships between higher education and work 139
6. Changing relationships between higher education and employment: the impact of increased numbers of students 174

CHAPTER 2. Recent developments in higher education 185

A. Higher education in the Federal Republic of Germany: a planned or market system? Or a third way?
by Klaus Hüfner 185
B. Labour market and educational forecasts in the Federal Republic of Germany
by Manfred Tessaring 197
C. Some manifestations and implications of underemployment of college graduates: the case of the Federal Republic of Germany
by Dirk Hartung 212
D. Certificates and recruitment
by Michael Buttgereit 217

Chapter 1. Higher education and the labour market

by U. Teichler and B.C. Sanyal

1. THE EDUCATION AND THE EMPLOYMENT SYSTEMS: STRUCTURES AND QUANTITATIVE DEVELOPMENT

1.1 Economy-population-employment

In the Federal Republic of Germany remarkable economic expansion has lasted for many years. The gross national product (GNP) rose from DM 100 billion in 1950 to DM 302 billion in 1960, DM 686 billion in 1970, and finally DM 1,492 billion in 1980. During the fifties, the post-war economic construction reached an impressive pace. The GNP doubled in constant prices during this period of "economic miracle", and the unemployment quota decreased from about 10 per cent to one per cent, although about 12 million refugees and deportees had to be reintegrated.

In the sixties, economic growth and full employment also persisted. The annual growth of GNP (in constant prices) went down in this period of stability from more than 6 per cent during the fifties to an average of 4.4 per cent which was comparable to the average growth rates in Western Europe. There was, however, no single continuous economic development: the first major recession was indicated by a 0.2 per cent decline of the GNP in 1967. Shortage of labour arose during the sixties; the demand was satisfied by foreign workers whose number rose from 0.3 million in 1960 to 1.9 million in 1970.

In the seventies, the average increase of GNP (in constant prices) slowed down to 3.0 per cent. Given the world-wide effect of the rising oil prices since 1973, this growth cannot be considered to be extraordinarily low; several revaluations of the German Mark, on the contrary, seem to indicate a relatively stable development. Under the prevailing economic system often referred to as Soziale Marktwirtschaft (social market economy) however, experts considered a growth rate of 3.5 per cent necessary to avoid an increase in unemployment.

Policy and planning of higher education reflected the economic development of the Federal Republic of Germany. Three major arguments can be found: first, for many years human capital theories spurred a political debate as to whether expansion of higher education was necessary to guarantee further economic growth; second, many international bodies and commissions argued that an affluent society such as that of the Federal Republic of Germany ought to offer higher education opportunities primarily according to social demand; third, the recent decline in growth rates increased concern about the utilization of the growing number of highly qualified manpower.

The country had 50 million inhabitants in 1950, 55.6 million in 1960, 60.7 million in 1970 and 61.7 million inhabitants in 1980 (including inhabitants of West Berlin). The resident population grew at a very low rate until 1974, and has continued to decline since then. The prior growth has to be attributed to a large extent to migration (foreign workers, immigrants from the German Democratic Republic and East European countries). The decline in the population began in 1974 as the active recruitment of foreign workers was discontinued due to the economic crisis following the oil price hike. Of the resident population in 1980, 4.5 million were foreigners.

The figures for live births show rapid changes within a short period. They rose from about 0.8 million in the early fifties to 1.07 million in 1964 and then fell fairly regularly to 0.6 million in 1978, after which they began to increase slowly. According to UN statistics (1980), the number of births for each 1,000 inhabitants is 11, which is lower than in any other industrialized countries. Since 1972, an excess of deaths over births can be observed. While in many other industrialized countries a peak in the curve of births in the post-war period was found in the fifties, the "baby boom" in the Federal Republic of Germany came a decade later. This "delay" has important consequences: An expansion of secondary and tertiary education due to demographic factors has to be expected at a time when economic problems have increased and the public mood is less favourable to educational expansion and expenditures than a decade ago. In addition, the number of youth transferring from education to work reaches its peak at a time when unemployment is likely to be much higher than in the early seventies.

The percentage of the inhabitants belonging to the working age population (15-64 years old) was 68 per cent around 1950 and 1960, but it fell to 65 per cent in 1980. These figures are very close to the average in industrial countries. The life expectancy in the Federal Republic of Germany is 73 years - according to UN statistics (1980) -, slightly lower than in most other highly industrialized countries. The labour force increased, as Table 1 shows, from 22 million in 1950 to more than 26 million in 1960 and to 28 million in 1981.

Unemployment had been considered a marginal problem in the Federal Republic of Germany from 1959 until 1973, for the official unemployment quota remained almost constantly below one per cent and the registered vacant positions exceeded the number of unemployed persons. Since 1974, however, the official unemployment quota has been about 4 per cent (annual average), and the number of registered unemployed persons about four times as high as the number of registered vacant positions. The quota of youth unemployment (less than 25 years old) was 5.3 per cent in 1976 as compared to 4.0 per cent of the total labour force. In 1982, the percentage of unemployed for the total labour force was 7.2 per cent.

The development of employment in industrial sectors in the Federal Republic of Germany followed the general trend of industrial societies. As Table 1 shows, the percentage of persons employed in the primary sector (agriculture, forestry, fishery) declined from 24.6 per cent in 1950 to 5.9 per cent in 1980. The share of persons employed in the tertiary sector (trade, services, government) grew in the same period from 32.3 per cent to 49.0 per cent. In comparison to other western industrial countries - see Table 2 - the proportion of persons working in the production sector is unusually high. According to forecasts by the Institute of Labour Market and Occupational Research of the Federal Employment Agency, only a small decline in the percentage of persons employed in the secondary sector is likely in the eighties (1977: 46.0 per cent, 1990: 43.6 per cent). The important rôle of the production sector in the Federal Republic of Germany has sustained a strong vocational orientation of the education system as well as employers' reluctance to favour expansion of higher education.

Table 3 presents an overview of the development of occupational groups. The scheme of occupational groups aims at avoiding the mix of occupational activity and relation to the production process on the one hand and the employment status on the other hand. This is typical for groupings of occupations in many other countries, too. The data on occupational groups indicate more clearly than the data on the economic sector (Tables 1 and 2) a decline in the proportion of active persons in production processes in all major categories (Table 3, categories I-IV); the share of persons in production and related workers was 44.6 per cent in 1961, 36.1 per cent in 1970 and 35.8 per cent in 1980. At the same time, the percentage of service workers has increased from 7.6 per cent in 1961 to 9.5 per cent in 1970 and 10.7 per cent in 1980. One can also note the decline in the share of workers in agriculture and related professions.

Occupational statistics indicate in most cases an increase of persons employed in those categories where the share of university-trained people has traditionally been relatively high, and a reduction of persons employed in those categories in which the number of university graduates used to be small.

Table 1. Labour force in the Federal Republic of Germany, 1950-1981

Year	Labour force (in 1,000) (1)	Number employed (in 1,000) (2)	Employed in percent of (2): Agriculture forestry (3)	Production (4)	Trade transportation (5)	Services (6)	Government and private households (7)	Unemployed number (1,000) (8)	In percent of labour force (9)
1950[†]	21 960	20 376	24.6	42.6	14.3		18.4	1 584	7.2
1955[†]	24 165	23 230	18.5	46.6	15.9		19.0	935	3.9
1960	26 518	26 247	13.8	47.7	17.2	12.7	8.6	271	1.0
1965	27 038	26 887	10.7	48.8	17.6	13.5	9.3	147	0.5
1970	26 817	26 668	8.5	48.8	17.5	15.4	9.8	149	0.6
1975	26 397	25 323	7.2	45.9	18.0	17.4	11.5	1 074	4.1
1980	26 684	25 795	5.9	45.0	17.7		31.4	889	3.3
1981	27 992	26 947	5.2	45.0	17.3		32.5	1 272	4.6

[†] Excluding Berlin (West)

Source: K. Hüfner, H. Köhler and J. Naumann, Higher Education and Manpower Planning in the Federal Republic of Germany: Education and Employment Research (Industrialized Countries), ILO/CEPES Point Project, June 1977, p. 24 (1950-70); Bundesminister für Bildung und Wissenschaft, Grund- und Strukturdaten 1982/83, Bonn, 1982 pp. 232-239.

BEST COPY AVAILABLE

Table 2. International comparison of labour force 1981, (in percentage)

	F.R.G.	France	Italy	Japan	U.S.A.
1. Agriculture, hunting forestry and fishing	5.6	7.8	12.8	9.8	3.4
2. Mining & quarrying	1.4	0.7		0.1	1.1
3. Manufacturing	33.3	22.8	24.1	24.3	21.4
4. Electricity, Gas and water	0.9	0.9	1.0	0.5	1.3
5. Construction	7.3	7.8	9.0	9.6	6.3
6. Wholesale/retail trade, restaurants & hotels	14.2	14.8	16.8	22.3	20.0
7. Transport, storage and communications	5.7	5.8	5.0	6.0	5.0
8. Financing, insurance, real estate & business	5.6	6.8	2.3	5.8	8.2
9. Community, social and personal services	22.9	23.9	18.4	19.2	30.5
10. Not adequately defined	0.7	-	0.8	0.2	-
- persons seeking their first job	0.4	7.4 (1)	7.5 (2)	2.2 (3)	0.9
- Armed forces	2.0	1.3	2.3	-	1.9
	100.0	100.0	100.0	100.0	100.0
N=	26 936 000	22 970 200	22 804 000	57 070 000	110 812 000

(1) Unemployed, (2) includes other unemployed, (3) unemployed.

All estimates relate to 1981, except for Italy 1980.

Table 3. Structure of the economically active population by occupation (in thousands)

	1980(1)		1970(2)		1961(3)	
Professional, technical and related	3 712	13.4	2 608	9.8	2 036.9	7.6
Administration and managerial	792	2.9	585.5	2.2	836.7	3.1
Clerical and related	5 352	19.4	4 643.5	17.5	3 192.2	11.9
Sales workers	2 326	8.4	2 361.1	8.9	2 010.9	7.5
Service workers	2 957	10.7	2 528.6	9.5	2 035.8	7.6
Agriculture, animal husbandry, forestry, fishing etc.	1 455	5.2	2 033.7	7.6	3 626.7	(13.5)
Production and related workers, transport, equipment, operaters and labourers	9 876	35.8	9 606.9	36.1	11 969.4	(44.6)
Workers not classified	405	1.4	2 126.2 (including 1 886.8 (7.1) foreigners)	8.0	1 112.5(4)	(4.2)
Unemployed	765	2.8	116.6	0.4	-	-
Total	27 640.0	100.0	26 610.1	100.0	26 821.1	(100.0)

(1) LFSS, April 1980
(2) Based on a sample tabulation of census data
(3) Based on census returns
(4) Includes members of the armed forces.

As discussed below, this shift in the occupational structure, however, was - as in other industrialized countries - smaller than the increase in the percentage of the labour force holding a university degree.

1.2 Education structure and quantitative development of education

The school system in the Federal Republic of Germany has retained a basically vertical structure. After four[1] years of primary education for all (which had been introduced after World War I) at the *Grundschule*, pupils have to choose at the age of 10 which of the following to attend:

- the *Hauptschule* or main school, traditionally the integrated part to the *Volksschule* like the primary school. After finishing nine years of full time schooling, these pupils typically attend part-time vocational schools - often combined with apprenticeship training - until the age of 18;
- the *Realschule*, the intermediate type of secondary schools, normally leading to technical schools etc. and traditional prerequisite for entering intermediate positions in the occupational hierarchy;
- or the *Gymnasium*, the academic track of the secondary schools, typically preparing the students for university education.

The educational structure as well as the length of schooling is demonstrated in *Figure 1*.

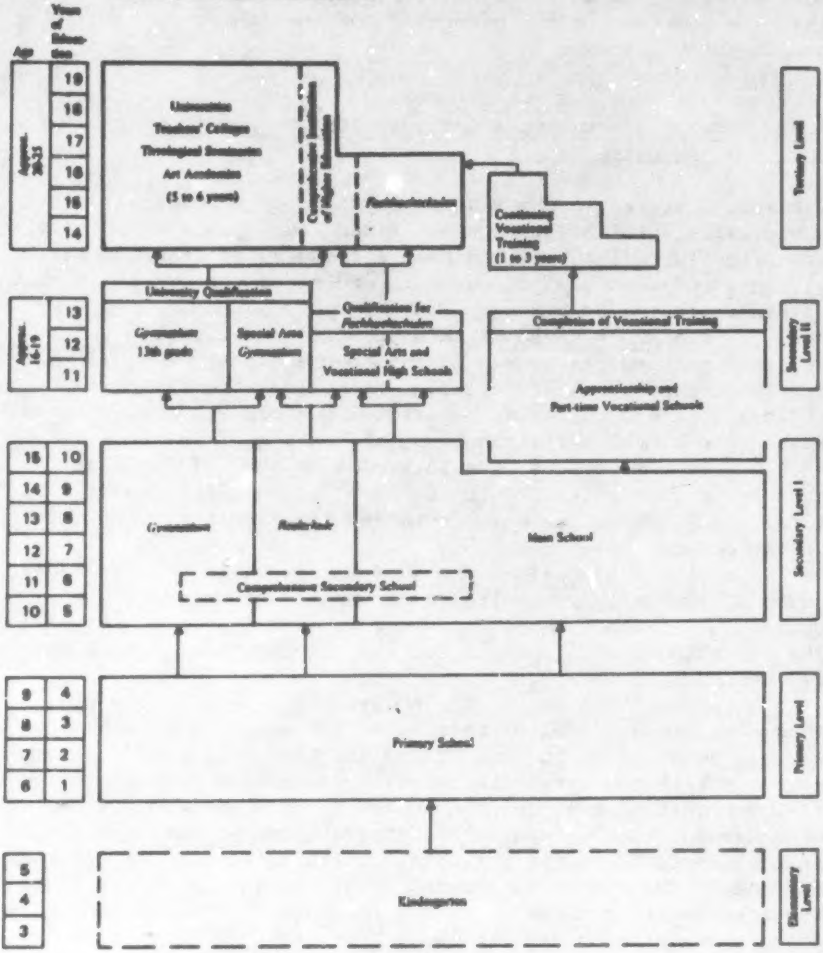
The vertical structure, however, has been "softened" in a process of many smaller reforms of the educational structure as well as of the opportunities to transfer. The major changes have been (i) the establishment of a variety of "second routes", i.e. for main school pupils to reach *Realschule*-level, for students having attended *Realschule* to reach the *Abitur*, the traditional certificate for a successful completion of *Gymnasium*, and the establishment of several other regulations which admit the transfer from lower to higher tracks; (ii) the introduction of an orientation period in the 5th and 6th grades; thereby the pupils' opportunity to shift from one level to another ought to be eased[2]; (iii) the establishment of comprehensive schools - along with the traditional system - in some states of the Federal Republic.

---

[1] Six years in the states of Berlin (West) and Bremen.

[2] In some cases an integrated orientation phase has been established: pupils attend partly common and partly individualized courses in the same school. In most cases, however, the pupils take one of the three tracks but can transfer more easily than previously.

Figure 1. The educational system[1]


Age
Years of Education
Approx. 20-25
19
18
17
16
15
14
Universities
Teachers' Colleges
Theological Seminaries
Art Academies
(5 to 6 years)
Comprehensive Institutes of Higher Education
Fachhochschulen
Continuing Vocational Training (1 to 3 years)
Tertiary Level
University Qualification
Approx. 16-19
13
12
11
Gymnasium 13th grade
Special Area Gymnasium
Qualification for Fachhochschulen
Special Arts and Vocational High Schools
Completion of Vocational Training
Apprenticeship and Part-time Vocational Schools
Secondary Level II
15
14
13
12
11
10
10
9
8
7
6
5
Gymnasium
Realschule
Main School
Comprehensive Secondary School
Secondary Level I
9
8
7
6
4
3
2
1
Primary School
Primary Level
5
4
3
Kindergarten
Elementary Level

---

[1] The structural chart does not indicate quantitative proportions of the individual institutions. The arrows indicate the most common transitions.

Source: H. Peisert and G. Framhein, Systems of Higher Education: Federal Republic of Germany, New York: International Council for Educational Development, 1978, p. 9.

BEST COPY AVAILABLE

Table 4 shows a remarkable expansion of the intermediate and the academic tracks of secondary education as well as an expansion of full-time and higher vocational education, whereas the number of students in main school and part-time vocational school remained fairly constant.

Table 5 shows that the secondary school leavers having completed the academic track and the higher vocational track rose from 5.5 per cent of the corresponding age group in 1960 to 10.8 per cent in 1970 and 22.0 per cent in 1980.

As mentioned above, several "second routes" and equivalences were established to open access to higher education. There exist now dozens of ways of gaining the educational prerequisites for access to higher education. According to the Federal Ministry of Education and Science, 68 per cent of beginner-students in 1976 had succeeded in the Abitur, the final examination at a (full-time) Gymnasium, 6 per cent had passed the Abitur at other similar institutions (like Gesamtschule, Kolleg, part-time school etc.), 16 per cent had finished the Fachoberschule (higher vocational school) which only opens the opportunity to attend short-cycle institutions, and finally 10 per cent had received qualification in some other ways.

Most of those successful in the academic and the higher vocational tracks of secondary education attend institutions of higher education. Those with other qualifications to enroll make up the rest. In 1950, the percentage of beginner-students of the corresponding age group was about 5 per cent, 8 per cent in 1960 (including forerunner institutions of Fachhochschulen), and 15.5 per cent in 1970. Since 1972 it has remained almost constant at 18 to 19 per cent. At present the proportion of university students in the relevant age group is not particularly high by international comparison. As discussed below, however, it is difficult to draw lines for equivalences of higher education between the Federal Republic of Germany and other countries.

At the moment, official documents classify institutions of higher education into six categories:

1. Wissenschaftliche Hochschulen: Include the traditional university incorporating the full range of faculties (medicine, law, theology, philosophy, natural sciences and economic and social sciences); the special universities - in most cases technical universities, because in pre-war Germany, engineering education had not been considered to be equal to the other disciplines; and, new universities created in the sixties and thereafter; most of them include a smaller range of subjects than the traditional universities.

2. Pädagogische Hochschulen: Teachers colleges used to train teachers for primary and lower secondary schools.

3. Theological seminaries: Either church or government institutions that exist outside the theology faculties at universities. In general, these seminaries confer doctor of theology degrees.

Table 4. Number of pupils and students in educational institutions 1950-1980 (in thousands)

Institution	1955	1960	1965	1970	1975	1980
1. Kindergarten, Nursery etc.	-	890	1,038	1,267	1,650	1,566
2. Primary School (Grundschule)	2,722	3,097	3,453	3,978	3,888	2,818
3. Special school	188	143	192	322	394	354
4. Main schools (Hauptschule)	2,223	2,122	2,112	2,369	2,536	2,226
5. Realschule	436	431	[illegible]	863	1,147	1,351
6. Gymnasium, 5th-10th grade	713	642	760	1,062	1,394	1,544
7. Gymnasium, 11th-13th grade	149	211	198	317	[illegible]	574
8. Comprehensive Schools	-	-	-	-	166	221
9. Evening schools, (Kolleges)	-	9	15	25	38	39
Total: school for general education (2-9)	6,361	6,655	7,302	8,937	10,033	9,127
10. Part-time vocational schools	2,302	1,662	1,780	1,600	1,636	1,970
11. (Berufsfachschule) Vocational School	156	139	167	209	299	352
12. (Berufsaufbauschule) Vocational extension school	-	-	53	40	28	22
13. (Fachoberschulen, Fachgymnasien) Vocational high schools	-	-	-	59	119	136
14. Schools for technicians etc. (Fachschulen)	146	142	146	154	205	196
Total: Vocational schools (10-14)	2,604	1,943	2,146	2,072	2,286	2,672
15. Engineering colleges short-cycle institutions*	36	44	61	100	145	202
16. Universities etc.	152	247	308	422	696	842

Source : Helmut Köhler, Der relative Schul- und Hochschulbesuch in der Bundesrepublik Deutschland 1952-1975, Berlin: Max-Planck-Institut für Bildungsforschung, 1978, pp.160-1 (Materialien aus der Bildungsforschung No.13) ; Data on Kindergarten etc. and on 1980 from Bundesminister für Bildung und Wissenschaft, Grund- und Strukturdaten 1982/83, op.cit.

* From 1955 to 1965: Ingenieurschulen; 1970 and 1975 :Fachhochschulen

** Including teacher training colleges, colleges of fine arts, and comprehensive universities.

BEST COPY AVAILABLE

Table 5. Access to higher education and graduation

		1960	1965	1970	1975	1980
Secondary school leavers (in 1,000)	Academic track	55.3	51.7	89.2	125.5	168.0
	Higher voc. track	-	-	-	46.7	50.6
	Total	55.3	51.7	89.2	172.2	218.6
Secondary school leavers (Percentage of 18-20 years' population)	Academic track	5.5	7.5	10.8	14.7	16.9
	Higher voc. track	-	-	-	5.4	5.1
	Total	5.5	7.5	10.8	20.1	22.0
Beginner students (in 1,000)	At universities	65.4	63.2	92.2	120.7	138.2
	At short-cycle inst.	20,6	26.5	29.2	42,8	51.7
	Total	88.0	89.7	121.4	173.5	189.9
Beginner students (percentage of 18-20 years' population)	At universities	6,5	9.2	11.3	14.1	13.9
	At short-cycle inst.	2,1	3,9	3.7	5.0	5.2
	Total	8.6	13.1	15.0	19.1	19.1
Graduates	Of universities	36.0	50.3	67.2	82.9	87.4
	Of short-cycle inst.	11,8	16.2	19.8	31.9	34.7
	Total	47,8	66,5	87.0	114,8	122.1

Source: Wissenschaftsrat, Zur Lage der Hochschulabsolventen Anfang der achtziger Jahre, Köln, 1983.

4. Kunsthochschulen: The academies of fine arts, design, theatrical arts, music, film and television prepare for a career in arts; some of them prepare students for teaching arts and music at schools.

5. Fachhochschulen: Whereas the institutions mentioned so far used to be considered "university-type institutions" in international comparison, the Fachhochschulen (vocational colleges) resemble non-university type institutions of higher education. Fachhochschulen were established in 1970-71 on the basis of a 1968 agreement between the different states. The former engineering schools and other advanced vocational schools (e.g. for commerce or for social work) which used to belong to the secondary level of vocational education, have been merged into the Fachhochschulen . The prerequisite for admission to these institutions is not, unlike the university-level institutions, to complete the academic track of secondary education, but the completion of the higher vocational school after the completion of the intermediate type of secondary schools, (12 years of schooling). Graduates of Fachhochschulen are entitled to be admitted to university-level institutions in their respective fields of study.

6. Gesamthochschulen: During the seventies, a few comprehensive universities had been founded which cover both university-level and non-university level higher education under one roof. All of them permit an easier transfer, some of them offer - partly or totally - integrated courses for both student groups (Abiturienten as well as those qualified for non-university level higher education).

The total enrolment in winter 1981/82 was more than 40,000 students at three universities and more than 30,000 at an additional four universities.

Table 6 shows the predominance of the university level in higher education in the Federal Republic of Germany. In 1980, nearly three-quarters of students were enrolled at Wissenschaftliche Hochschulen, and about a fifth at Fachhochschulen. Of the beginner-students in 1980, 73 per cent enrolled at university-level institutions (including teacher colleges, theology seminaries, art colleges and comprehensive universities), and the remainder at Fachhochschulen.

Table 7 presents an overview of the major fields of studies chosen by students at institutions of higher education in the Federal Republic of Germany. The largest enrolment figures can be found in social sciences and humanities (including teacher training).

Students in Fachhochschulen are enrolled mostly in engineering, commerce and social work. Since about 1980, public administration became the fourth major subject in short-cycle higher education, because of the process of legal incorporation

Table 6. Students at Institutions of Higher Education by Type of Institution[+], 1950-1980

Type of Institution		1950	1960	1970	1975	1980
Universities (including technical universities and special universities)		112,000	217,000	350,000	553,000	735,000
Comprehensive universities		-	-	-	42,000	70,000
Teachers colleges	ca.	10,000	33,000	59,000	79,000	19,000
Theological seminaries		5,000	3,000	2,000	2,000	2,000
Art academies		5,000	8,000	11,000	15,000	18,000
Fachhochschulen (short cycle institutions)	ca.	40,000	ca. 68,000	ca. 112,000	146,000	202,000
Total	ca.	172,000	ca 329,000	ca. 534,000	837,000	1,044,000

Source: H. Peisert and G. Framhein, Systems of Higher Education: Federal Republic of Germany, op. cit., p. 14; data on 1980 from Bundesminister für Bildung und Wissenschaft, Grund- und Strukturdaten 1982/83, op. cit.

[+] including foreign students; the figures are those of the winter semesters.

Table 7. Field of study of students, winter 1980/81 (Percentage)

Field of study	University-level institutions	Short-cycle institutions	Total Total
All students			
Humanities	30.5	1.4	24.9
Economics, social sciences	22.4	41.4	26.0
Mathematics, science	18.2	3.1	15.3
Engineering	11.2	45.6	17.9
Medical fields	10.0	-	8.0
Agricultural fields	2.6	3.4	2.8
Music, fine arts	5.1	5.1	5.1
Total	100.0	100.0	100.0
Absolute number (in 1,000)	842.2	202.0	1 044.2
Female students			
Humanities	44.8	3.4	38.4
Economics, social sciences	17.2	63.9	24.5
Mathematics, science	16.1	2.5	14.0
Engineering	2.4	15.9	4.5
Medical fields	9.1	-	7.7
Agricultural fields	3.1	4.9	3.3
Music, fine arts	7.2	9.4	7.5
Total	99.9	100.0	99.9
Absolute number (in 1,000I	326.6	59.6	383.2

Source: Based on Bundesminister für Bildung und Wissenschaft, Grund- und Strukturdaten 1982/83, op.cit., pp. 124-5.

of former higher vocational schools for publication administration into the system of higher education. In the case of engineering, the number of short-cycle graduates exceed by far the number of university graduates. In economics, however, the reverse pattern can be found. Finally, higher education in the field of social work used to be offered only in Fachochschulen.

Only about 37 per cent of all students at institutions of higher education are female. The percentage had been much smaller in the fifties and sixties. It is impossible, however, to claim a constant trend towards an even share of both sexes in higher education, for the percentage of female freshmen underwent irregular changes during the seventies. After a rise from 31 per cent in 1970 to 40 per cent in 1974, it decreased to 35 per cent in 1976 and rose again to 40 per cent in 1980. From 1970 to 1977 the percentage of female secondary school graduates eligible to enroll at institutions of higher education increased from 37 per cent to 47 per cent.

Finally, some information on the age composition of students should be given here. In 1980, only 13 per cent of students were 20 years old or younger, 56 per cent were 21 to 25 years old, 20 per cent were 26 to 29 years old and 11 per cent 30 years or more. German students are older than their counterparts in most other countries, because:

- admission to universities requires 13 years of school education;
- about half of university freshmen have spent some time outside the educational system after completing secondary education (military service, waiting time before entering a numerus-clausus subject, other activities);
- the time span for obtaining a college degree is very long at German institutions of higher education: the average university graduate in 1980 had spent almost six years at institutions of higher education before earning his degree,[1] the graduate of a Fachhochschule, almost four years.

Exact figures on the number of "adult" students - students having spent many years in gainful employment before enrolling at institutions of higher education - are not available. Yet it is almost certain that this group comprises less than 10 per cent of all students.

---

[1] According to computations by the Federal Ministry of Education and Science, the average stay at universities until the first degree rose from 5.7 years in 1970 to 7.2 years in 1974 and fell to 6.5 years in 1976. Of this 6.5 years, 1.6 years are due to changes in the field of study or prolongations because of transfers to different types of higher education. Cf. Bundesminister für Bildung und Wissenschaft, Grund-und Strukturdaten 1978, Bonn, 1978, p.126.

1.3 Higher education and the labour market: a quantitative overview

It is very difficult to present a reliable overview on the state of employment of university graduates in the Federal Republic of Germany, because few data are available. The regular employment surveys do not include the educational background, and therefore one has to turn to the census data collected once in ten years. In the United States, Japan, Sweden or the United Kingdom, surveys are conducted to find out the whereabouts of college students some months after their graduation. In the Federal Republic of Germany, however, one cannot find any data of this kind. Moreover, exact figures of the number of graduates are missing. A few dozens of surveys on single fields of studies or occupations have been conducted, but they are insufficient to present a comprehensive view. In other words, the available data offer only some interesting insights to the development existing in higher education and employment after World War II, but are insufficient for an analysis of recent changes in the labour market of college graduates especially due to the economic problems since 1973.

Of the total labour force in 1950, only about 2 per cent had taken a degree at a university-level institution (according to present standards, i.e. including teacher colleges etc.). By 1961 this figure had risen to 2.9 per cent, and in 1970 to 3.8 per cent. Of the total labour force in 1970, 73 per cent had been at main schools with or without additional apprenticeship training, 20 per cent had attended the intermediate track of secondary education and/or had higher vocational training, 1.8 per cent had the Abitur certificate but no college degree; it can be assumed that the majority of them are college dropouts. Finally, 1.5 per cent of the labour force were graduates of engineering colleges.

In 1980, 5.5 per cent of the labour force were university graduates, and 2.8 per cent were graduates from short-cycle institutions. According to estimates presented in 1976 by the Federal-State Commission for Educational Planning and Research Promotion, one can assume that about 11 per cent of the labour force in 1990 will be college graduates.

Table 8 gives an overview of the employment of university-trained persons in 1961, 1970 and 1980. These data can be taken as indicators of the fact that the increase of 39 per cent during each decade in the number of persons who had acquired a university degree had not led to any substantial changes in their occupational perspectives. Almost half of the additional occupations for university graduates had been created in the teaching profession. In most occupational groups, the percentage of university-trained persons increased only marginally, or even

Table 8. Employed university graduates by economic sector in 1961, 1970 and 1980

Economic sector	1961 Percentage of graduates	1970 Percentage of graduates	1980 Percentage of graduates	1980 Percentage of labour force in corresponding sector	1980 Absolute number (in 1,000)
Agriculture, forestry	0.8	0.6	0.5	0.5	7.0
Mining, energy	1.0	0.8	0.8	2.2	11.2
Industrial production	11.9	12.6	10.4	1.7	155.1
Construction	1.1	1.0	0.9	0.7	14.0
Trade	5.0	4.8	4.0	1.9	58.8
Transport and communications	1.0	1.1	1.0	1.1	15.6
Finance	1.6	1.9	1.9	3.4	28.8
Private professional services	6.5	6.1	5.5	13.5	82.2
Hotel, restaurant services, etc.	0.5	0.6	0.6	1.3	9.4
Other services	0.2	0.4	0.4	0.9	5.2
Health services	13.9	12.3	12.3	15.7	182.8
Science, education, arts, journalism	39.4	43.5	43.1	51.6	640.5
Non-profit organizations	5.8	4.5	7.6	21.5	113.3
Government and social security	10.8	9.8	10.9	7.7	161.7
No response	0.5	0.1	-	-	-
Total	100.0	100.0	100.0	5.8	1 485.6
Absolute number (in 1,000)	772.6	1 070.0	1 485.6		

Source: Census und Micro-census data compiled by Bund-Länder-Kommission für Bildungsplanung und Forschungsförderung, 1983.

decreased. It is safe to assume that the rising number of college graduates during the sixties had been absorbed by the general change in the occupational structure. In addition, the growing percentage of college-trained persons in some occupational groups had generally been considered to meet the rising requirements in these groups.

The statistics do not show exactly what percentage of university graduates are working in the public sector. Estimates vary from 50 to 60 per cent. Of the graduates of Fachhochschulen, who are not included in this table, less than one-third are employed in the public sector. Table 8 suggests, however, that the proportion of university-trained persons working in the public sector did not diminish during the sixties and seventies.

The 1970 census also provided data on the relationship between education and income. In 1970, the average monthly income of persons having a university degree was two and a half times as high as that of persons who had not completed any vocational training. It almost exceeds twice as much the income of persons having completed compulsory education and apprenticeship. The small difference in the income of university graduates and short-cycle graduates is, however, misleading. In the case of short-cycle graduates, only those from engineering colleges were taken into account. Special surveys, though, show that the income advantage of university-trained engineers, as compared to graduates of engineering colleges, used to be much higher.

A more recent article on the income of employees and workers being included in the public social security system showed that university-level manpower of these categories had an 11.5 per cent higher salary than graduates from short-cycle institutions.

During the seventies, the job prospects of college graduates deteriorated. Three major causes should be mentioned:

1. In the sixties, the expansion of the education system was accompanied by a rapid expansion of the teaching profession. About half of the additional positions for university graduates during the sixties had been created in this area. A reverse trend during the seventies had to be expected, not only because of a slow-down of the expansion process but also because of the age composition of teachers. Because mainly newly-trained teachers had been hired during the sixties, the proportion of those teachers aged 55 or more, which represented 25 per cent of the teaching staff in 1955, decreased to about 8 per cent in 1974.

2. Private and public employers in the Federal Republic of Germany remained reluctant to recruit a larger number of college graduates and to upgrade positions even during those years around 1970 when economic prospects were good and the public mood was favourable towards educational expansion.

3. The economic problems caused by the oil price hike in 1973 led to a significant increase in unemployment. In addition, doubts grew about the need for increased numbers of college-trained persons in the face of low growth rates and rising difficulties to increase the share of public expenditures.

Although scarce, the available statistical data on the recent development of the labour market for college graduates after 1973 will be presented below. Table 9 shows the development of the number of candidates passing the final examinations in universities in the Federal Republic of Germany, without adjusting for cases who appear in more than one examination. The number of successful graduates is not, however, equivalent to the number of new potential highly qualified work force. Among others, some persons complete two degrees in one year (for instance, state examination and doctoral degree in medicine), some students continue studies in order to get a further degree, some graduates do not intend to work, and about 10 per cent of those taking examinations are foreigners, most of whom will not work in the Federal Republic of Germany.

In spite of the shortcomings of the data presented, we may conclude from Table 9 that the growth rate of graduates accelerated after 1970. The number of graduates seeking a job increased strongly just at a time when economic problems grew.

At this point, a brief explanation of university examinations and degrees in the Federal Republic of Germany should be given. In some subjects, especially humanities, law and medicine, the students usually do not receive a university degree but rather take part in a first state examination. After an in-service period in schools, hospitals, public administration, courts, etc., they have to pass a second state examination. The first is considered to be only a preliminary qualification, whereas the second testifies to the professional proficiency. This means that a person who has attained the first state examination and is then employed in the private sector will not be considered to be fully qualified and cannot transfer to a job in the public sector.

The students in humanities not heading for teaching positions may take a university degree (magister); those fields of studies primarily preparing for private sector jobs are provided with university degrees (diploma) only, e.g. economics and engineering.

As Table 10 shows, the work prospects of college graduates had been affected adversely by the general rise of unemployment since 1973. In autumn 1981, the number of unemployed university graduates was five times as high as in autumn 1973; the unemployment quota of persons who had graduated from short-cycle institutions nearly tripled in this period. It should however be noted that unemployment of this type of graduates

Table 9. Number of successful graduates in final examinations at universities and colleges, 1960-1980 (in 1,000)*

Type of examination:	Diploma First State Examination	Doctoral Degree	Teachers examination (no. of persons)	Graduation at short-cycle institutions	Total
a. Year					
1960	20.3	6.2	9.5	11.8	47.8
1965	25,5	7.7	17.1	16.2	66.5
1970	30.1	11.3	25.8	19.8	87.0
1975	33.7	11.4	37.8	31.9	114.8
1980	46.3	12.2	28.9	34.7	122.1
b. Field of study 1980					
Humanities	7.1	1.1	17.4	0.7	26.3
Economics, social sciences	14.1	1.2	2.3	13.8	31.4
Mathematics, sciences	6.5	2.7	6.3	1.1	16.6
Engineering	6.7	1.0	0.6	16.1	24.4
Medicine etc.	9.0	5.7	-	-	14.7
Agriculture etc.	1,7	0.3	0.3	1.5	3.8
Music, fine arts	1.3	0.2	2.0	1.4	4.9

Source: Bundesminister für Bildung und Wissenschaft, Grund- und Strukturdaten 1982/83, op.cit., p.158-9.

* Including foreigners.

BEST COPY AVAILABLE

Table 10. Unemployment quota of highly qualified manpower

Year*	Unemployed University graduates	Unemployed short-cycle graduates	Unemployed quota of total labour force
1973	0.5	0.9	0.8
1974	0.8	1.8	2.0
1975	1.3	2.7	3.7
1976	1.6	2.8	3.4
1977	1.7	2.6	3.4
1978	1.5	2.0	3.2
1979	1.6	1.9	2.7
1980	1.8	1.9	3.0
1981	2.4	2.4	4.4

1981 Unemployment quota of

1. Teachers	2.2%
2. Social scientists	9.9%
3. Economists	1.7%
4. Psychologists	8.8%
5. Law graduates	1.2%
6. Engineers	2.5%
7. Medical professors	1.3%

Source: Based on Manfred Tessaring, "Beschäftigungsmöglichkeiten und Arbeitsmarktrisiken hochqualifizierter Arbeitskräfte", in Aus Politik und Zeitgeschichte : Beilage zur Wochenzeitschrift Das Parlament, September 1980, p.30.

* September of respective year.

rose to its peak in 1976, then went down, before rising again in 1981. The unemployment quota of persons holding a college degree remained, however, far below the average for the total labour force: in autumn 1982, 3.9 per cent of university-trained persons and 3.6 per cent of graduates of short-cycle institutions were registered as unemployed, as compared to 7.2 per cent of the total labour force. The unemployment affected most seriously unskilled labour. Among university-trained graduates, unemployment was highest for social scientists (9.9 per cent) and lowest for law graduates (1.2 per cent) in 1981.

It is generally assumed that since the mid-seventies a considerable proportion of university graduates have taken over positions previously considered the preserve of non-graduates. The available data, however, do not permit accurate estimates about the percentage of graduates taking over such positions.

2. CHARACTERISTICS OF HIGHER EDUCATION AND EMPLOYMENT IN THE FEDERAL REPUBLIC OF GERMANY

2.1 The relevance of the characteristics of a given system

Development of the relationship between higher education and employment in a given society cannot be fully understood unless one takes into consideration the characteristics of the higher education and education system in general, of the occupational system and of the links between higher education and employment which have been established in the course of history. Undoubtedly, industrial societies have much in common as far as their knowledge, its transmission and utilization are concerned, which makes international comparison useful for planning purposes in a given society. But, international comparison has also to stress the characteristic aspects of a country under consideration

2.2 State institutions and public responsibility for planning higher education

One characteristic of higher education in the Federal Republic of Germany has far-reaching consequences: the fact that it is for the most part a public concern - that means under state and federal control. Ninety-eight per cent of all students are enrolled in public institutions. The remaining 2 per cent are distributed among a handful of parochial colleges and private technical colleges, which for the most part are financed by public funds as well. Furthermore, students have no college fees to pay. Finally, over half of all college graduates have found a position in public administration, in the education system which is almost exclusively state-controlled, or in those professions over which state planning and regulatory activities have considerable influence. This leaves government with a heavy responsibility for the quantitative development of higher education: among other things, in setting priorities with regard to public funding (here, higher education in relation to other social services); in opening up opportunities for broader participation in higher education; in providing the labour market with highly qualified manpower; in providing training for a new generation of public employees; and in bearing responsibility for scientific development.

2.3 The promotion of specific qualifications

The academic as well as political debate varies in thrust from one country to another, depending on whether education is seen as a process by which special and distinct qualifications are acquired for application in specific occupations, or whether education is understood as a process by which the student develops a particular overall level of competence and ability. In every country the education system has no doubt the function of promoting qualification in general, as well as providing training in specific skills. It also holds true to all countries that there are considerable differences in the degree to which a course of training is specialized from one field to another, as well as between the various institutions. Nonetheless, it appears on balance that the relationship between the education and occupation systems is characterized by one of two relatively clear assumptions: either that specific qualifications lead to particular occupations, or a certain educational level leads to a certain range of occupations.

To illustrate the difference in emphasis between the Federal Republic of Germany and the United States, one may speak in the United States of "over-education", on the assumption that further college education would provide no additional income advantage. In the Federal Republic of Germany, it is more likely that the same state of affairs would give rise to fears that the qualifications provided are "wrong" and that the person is not prepared well enough to carry out his job correctly.

The notion of specific qualifications in the Federal Republic of Germany has added to the fear of mismatches between demand and supply of highly qualified manpower. More than in other countries, scholarly publications and research activities were focussed on the question of how much flexibility could be expected in the relationship between training and occupation.

2.4 Emphasis on preparation for career

The promotion of specific qualifications has contributed to the fact that universities in the Federal Republic of Germany are ascribed a predominantly occupation-preparatory function. The strong occupation orientation by no means corresponds to the self-image of university. Academic or research-oriented education (wissenschaftliche Bildung) has traditionally stood in the foreground and so career training was generally reserved for the period of about two years after graduation. Here it may as well be added that there is widespread criticism that the university does not take sufficiently into account the qualification requirements in the occupational system. But, as far as curriculum is concerned, it shows a higher degree of career-oriented specialization in most subjects. German universities were considered to be institutions for intellectual, research-oriented education. Non-cognitive socializing effects were considered less important. Again, one must state that according to the traditional ideal of Bildung durch Wissenschaft (education through research), socialization was not to be forgotten, but there were hardly any devices in the universities to shape intentionally the personality development of the students. Research has shown that universities were hardly aware of their socializing effects, that graduates complained about problems of adjusting to the social organization of the enterprises, and that the development of social skills was generally lacking.

2.5 Academic and research orientation of higher education

The principles of Einheit von Forschung und Lehre (unity of research and teaching) and Bildung durch Wissenschaft (education through research), combined with the freedom of teaching and learning, served as guidelines in the reform of the University of Berlin in the early 19th century and had a considerable influence on the history of German higher education, as well as universities in many other countries. In the meantime remarkable modifications have been made; for instance basic and applied research outside the university plays an important rôle; but the curriculum is set in such a way that in some fields of study only the advanced students are given the opportunity to attend certain research-oriented seminars. Nevertheless, research orientation has played an important rôle up to now. At universities there is not a professor exclusively in charge of research; the students have the right to go from one university to another during their course of studies. Many courses are open to beginner-students as well as to advanced students, and graduate studies are not strictly separated from undergraduate studies. The first degree is considered to be equivalent to a Master's degree rather than a Bachelor's and until recently the successful students did not mind prolonging their studies considerably beyond the regular time span required to obtain a degree.

2.6 Homegeneity of institutions

The universities in the Federal Republic of Germany are considered to be more or less equal in standard. Traditionally students made choices not because the institution was famous but because they wanted to attend the courses of certain perhaps well-known professors. These professors moved from one institution to another; they could attain better financial conditions, more assistants and better facilities, only if they had received a "call" from other institutions.

The principle of homogeneity was underlined when restricted admission spread. According to the general regulations established in 1972, the qualified student keeps the right to enroll in any field of study at any university. Restricted admission, as far as it is unavoidable, is administered by a central agency which takes into consideration the applicant's choice of university, but the admission system rests on the assumption that the institutions are more or less equal in standard. However, the admission system makes a clear-cut distinction between university-level institutions on the one hand and short-cycle higher education on the other. In spite of those differences, the principle of equal standard has fundamentally been upheld until today. This holds also true as to the rights, privileges of the institutions, planning and financing of universities and recruitment policy in the public sector.

2.7 Additional characteristics

The characteristics so far mentioned have been dealt with in many studies on higher education and employment in the Federal Republic of Germany. Two further aspects ought to be mentioned in order to secure a better understanding of recent developments. First, doubts about a "soft market" for college graduates are widespread. It is generally believed that a growing supply will not be easily absorbed through substitution processes. Also, processes such as decline of income advantages, a lowering of aspirations and consequently in the long run a reduced number of applicants cannot be taken for granted, as might be the case for a functioning market.

Second, the debate on equality of opportunity had specific features in the Federal Republic of Germany. Although the aim of equality of opportunity for education was stressed very much in educational policy during the sixties and some measures were applied to encourage opportunities for the disadvantaged, there was hardly any compromise in terms of standards. For example, criteria of admission to university were only marginally changed for the sake of "non-traditional" students. In the case of semi-professional education, the upgrading of higher vocational schools to vocational colleges was accompanied even by a rise in the level of educational prerequisites. In the case of selective admissions to institutions of higher education, the social criteria would only be applied after a certain set of uniform and relatively high standards had been fulfilled by the applicants.

2.8 The changing rôle of the characteristics in the process of expansion of higher education

According to some views, the characteristics of higher education and its relationship to the employment system in the Federal Republic of Germany are just the features which can only survive if the number of students remains low. As has often been argued, the homogeneity of the institutions and the research-orientation caused considerable wastage because research funds were spread over and talented students and top-rank scholars scattered among a large number of institutions. Also the fairly even standards of universities are often thought to be unsuitable for a large number and a growing diversity of students, and according to such views they are not in tune with the requirements of the occupational system. Finally, the concern for specific qualification has often been criticized for producing problems of adjustment in the labour market for graduates and not fitting to a quick turn-over of knowledge.

It is obvious at any rate that the transfer of the system to a stage which has been often referred to as "mass higher education" has caused more problems in the Federal Republic of Germany than in many other countries, for the expansion and its effects did not affect mainly the less prestigious institutions.

As opposed to such views that the characteristics are outmoded, one might argue, however, that the preservation of some characteristics offer a genuine opportunity to develop an interesting alternative to other models of "mass higher education". To take a few examples of such arguments:

- First, the traditional goals of "education through research" and of equal standards of institutions has accelerated a spread of quality-minded higher education over a large number of institutions and thus prevented steep hierarchies in self-image among scholars, students and graduates. This might also turn out to be an ordeal for the existing ranking system of jobs.
- Second, the tradition of research-oriented education and the fairly specialized education support concepts of "occupational identity". The graduates thus trained might

be more inclined to challenge the occupational tasks offered, and so contribute more to innovation than students who have no specific commitment which combines education and work. This study does not attempt to evaluate the characteristics of higher education and employment in the Federal Republic of Germany. Only such diverse views visible in the country itself ought to be mentioned in order to point out the challenge of alternative cases to be considered for a desirable relationship between higher education and employment.

3. CHANGING ISSUES OF THE POLITICAL DEBATE ON THE RELATIONSHIP BETWEEN HIGHER EDUCATION AND EMPLOYMENT

3.1 Reconstruction period (1946-1956)

During the first post-war years many proposals were made for sweeping reforms of the system of higher education in the western zones of Germany. In the end, however, the view prevailed that the universities were "im Kern gesund" (basically sound) and that undue political power had been the major cause of the subordination of universities under the Nazi regime. Universities therefore sought to strengthen their academic autonomy and in fact, "became stronger than ever before in their partnership with the states"[1]. The traditional university was restored with the decision-making power of full professors, the close link between teaching and research, homogeneity of institutions as well as promotion of fairly specialized competencies.

The Basic Law of 1949 stressed the principle of cultural federalism. Each state was responsible for legislation, supervision and financing of its institutions of higher education. The principle of cultural federalism did not mean, however, that a state could develop different patterns of higher education as can be observed in the United States, for one Constitutional norm demands "the preservation of uniform living conditions" in the Federal Republic of Germany. During the fifties, the Permanent Conference of the Ministers of Culture of the States of the Federal Republic of Germany did not foster any plans at all for the quantitative and structural development of higher education, but only tried to counterbalance the heterogeneity on the part of education preceding the entry to universities and examination at universities.

---

[1] Dietrich Goldschmidt, "Autonomy and Accountability of Higher Education in the Federal Republic of Germany" in P.G. Altbach, ed., *The University's Response to Societal Demands*, New York: International Council for Educational Development, 1975, p.155.

As from 1954, the number of university freshmen grew at an annual rate of about 7 per cent mainly due to demographic factors. As the principle was still maintained that all Abiturienten were entitled to enroll, the percentage of public expenditure on higher education and research grew from 1.4 in 1950 to 1.8 in 1956.

3.2 First steps towards higher education and manpower planning (1957-1962)

As from about 1955, the view became prevalent that more co-ordination of efforts was necessary in order to cope with the growing number of students and with the problems of research. It also seemed obvious that a mere widening of the existing universities - without internal organizational reforms and the establishment of new institutions - could not be continued.

In 1955, the Federal Ministry for Atomic Issues was founded to take care of the new and most expensive branches of research - nuclear and space research. In 1956, for the first time, the federal government took over an active rôle in financing the semi-governmental research bodies and the expansion of higher education.

The establishment of the Science Council (Wissenschaftsrat) in 1957 proved to be a major step towards quantitative and structural planning of higher education. This advisory body consisted of representatives of the states and the federal government. Originally it bore the responsibility of drafting plans and making recommendations for the advancement of science, but it soon turned its scope towards the development of the system of higher education in general.

Many popular descriptions of the post-war development of education in the Federal Republic of Germany claim that the concern about highly qualified manpower began to shape educational policy around 1963/64. Against this view, some authors convincingly show that these considerations had started already in the fifties[1]. The "Sputnik shock" affected the debate, and some experts considered necessary the transition from extensive economic growth of the reconstruction period to intensive growth which requires a higher quality of labour.

In 1957 for instance, the Federal Ministry for Internal Affairs called for a capacity increase of higher vocational schools of engineering (Ingenieurschulen), the forerunner institutions of Fachhochschulen. It proposed an enlargement of 60 per cent until 1970. In 1958, the Permanent Conference of the Ministers of Culture published the first survey on demand and supply of teachers, showing that the number of beginner-students at teacher colleges was lower than the replenishment demand. There was an estimated total undersupply of 7,000 teachers.

---

[1] Hüfner, Köhler and Naumann, op.cit., pp. 53-62. For a more detailed over-view, see Klaus Hüfner and Jens Naumann, Konjunkturen der Bildungspolitik in der Bundesrepublik Deutschland. Band I: Der Aufschwung (1960-1967), Stuttgart: Klett, 1977.

In 1960, the Science Council made its first recommendations for rapid expansion of the teaching staff at universities, improvement of the status of the junior faculty and an increase in expenditures on higher education. The estimate of a growth in enrolment at universities from about 200,000 in the late fifties to 250,000 in 1970 looks in retrospect extremly conservative. Public expenditure on higher education as well as the number of professional staff of universities rose quickly. During the [illegible] years following that recommendation, both figures increased by more than 100 per cent. The human capital approach was used for the first time in 1962 to estimate the required university graduates. Edding, the pioneer of economics of education in the Federal Republic, called for a total of 250,000 university students in 1970 and of 400,000 for 1980. In the same year, the Permanent Conference of the Ministers of Culture made public a more detailed "estimate of manpower requirements", pointing out the danger of a shortage of 300,000 teachers during the sixties.

During the early sixties, however, the forecasts and proposals for planning met sceptical reactions and opposition, for economic success as well as the political East-West conflict at that time supported an anti-planning mood. It was also doubted whether the need for a substantial increase in highly qualified manpower existed at all - a term, by the way, which would not have been used at that time.

3.3 The breakthrough of expansion-oriented policy of higher education (1963-1970)

Two publications seem to have made an extraordinary impact on the spread of the view that a prosperous and modern society needs a much larger share of highly educated people than could be found then in the Federal Republic of Germany. Published in 1963-65, they triggered off a debate which finally led in 1970 to the adoption of a long-term policy of deliberate rapid expansion of education.

Georg Picht, a philosopher and historian, warned the public that the economic growth might come to an end if the "catastrophe of German education,"[1] which had caused a lack of qualified manpower, was not counteracted. He argued that the number of university-trained people graduating during the sixties would meet only the demand for new teachers. He considered more than a doubling of Abiturienten to be necessary during the sixties and, in addition, called for a rapid increase in higher education.

---

[1] Georg Picht, Die deutsche Bildungskatastrophe, Olten and Freiburg Walter, 1964.

The sociologist, Ralf Dahrendorf, argued in his book "Education is a Civil Right"[1] that the liberation of mankind from unintended bounds of the traditional social structure and educational inequality was a prerequisite for the development of a modern society. According to his view, a tripling of intermediate secondary education and of higher education might be in tune with the economic development, but an "active educational policy" ought to be based primarily on the aims of supporting civil rights and the general modernization of society. His survey on inequality of educational opportunity revealed that around 1960 only about 5 per cent of university students were from blue collar background. This study was often cited in the political debate until the early seventies.

Some observers believe that nothing but the wide scope of conflicting arguments in favour of an active educational policy , combining the concern for economic growth and other socio-political ideas, finally made possible a deliberate policy of educational expansion.

Table 11 shows that by 1982 the percentage of university students with fathers employed as manual workers had quadrupled in comparison with the early sixties. The rising popularity of proposals to secure economic growth and social justice through the expansion of secondary and higher education did not necessarily mean that it led to a rapid change in higher education planning. The reluctance to support a more rapid expansion of higher education was based on two concerns: on the one hand, the financial burden for the states, and on the other, the demand on the part of the occupation system for the growing number of graduates.

Advisory bodies and special planning agencies began to question whether the open, loosely structured and research-oriented system of teaching and study at the universities should or could be preserved for all the students, or for the system of higher education at all. The Science Council for instance proposed in 1966 a division of study programmes into three stages: first, a four-year programme with strict curriculum regulation leading to the first professional degree (in 1965, the average length of study up to the first degree was 5.4 years); second, a graduate research-oriented study programme;

---

[1] Ralf Dahrendorf, Bildung ist Bürgerrecht, Hamburg, Nannen, 1965.

Table 11. Social background of university and short-cycle institution students

Father's occupation	Universities 1952	1962	1967	1973	1976	1979	1982	Short-cycle institutions 1973	1976	1979	1982
Civil servant	38	33	30	27	25	24	24	15	14	14	15
Salaried employee	23	30	31	33	35	36	37	31	31	32	36
Self-employed	35	28	30	26	24	22	21	23	21	19	20
Manual worker	4	6	7	11	13	14	16	27	28	27	28
Other	0	3	2	3	3	4	2	4	6	8	1
Total	100	100	100	100	100	100	100	100	100	100	100

Source: Regular surveys on "Das soziale Bild der Studentenschaft".

and finally refresher courses to renew professional competence. An advisory body for higher education planning was set up in Baden-Württemberg and in 1967 suggested the establishment of comprehensive institutions of higher education; the plan not only proposed an expansion of practice-oriented programmes of study at Fachhochschulen, but also argued strongly for the introduction of three-year programmes at universities with concentration on teaching rather than research. The proposals met with strong opposition in the academic community, but ideas for expansion of short-cycle higher education have remained a major theme of higher education planning up to the present.

The first study which bore methodologically a more stringent forecast of demand for university graduates was published in 1967. This study, carried out under commission by the Science Council, followed the manpower requirements approach. It came to the conclusion that by 1980 there would be about twice as many graduates as job openings for people with their qualifications. The major debates and political activities as regards higher education during that period did not focus on its quantitative and structural development, but rather on the objectives of higher education (Idee der Universität), the teaching and the internal organization. The student protest supported the spread of the view that the internal organization centering around the full professors (Ordinarienuniversität) was outmoded, that teaching and research in general showed signs of isolation from the society ("ivory tower") and that the universities had not been able to deal with the influx of new students, most of whom had difficulties in coping with the environment of the traditional universities. A series of new laws for higher education introduced in most states around 1970 stressed internal organizational reforms and created substantial voting rights for junior teaching staff, students and other staff members at universities.

Student protest and considerations for educational reform on the one hand, and proposals for structural and quantitative changes in the system of higher education on the other, however, met at one point: the upgrading of former higher vocational schools to non-university level institutions of higher education. The states signed a contract in 1968 to establish Fachhochschulen. In 1969, institutional changes were made in order to secure a more co-ordinated planning of higher education and the Constitution of 1949 was amended. A ministerial report on these changes and the immediate consequences reads: "The construction and expansion of higher education establishments, the promotion of supraregional planning of research and education were grounded in the Basic Law as joint tasks of the federal government and the states. In addition, the federal government was empowered to draft a law setting forth

the general principles of higher education. Another change bearing on educational policy is the federal government's newly acquired legislative authority to control educational grants"[1].

In the same year the Higher Education Construction Act was passed. This legalized the heavy federal subsidies for construction in higher education which had started on a federal-state contract basis in 1964. The Planning Committee for Construction in Higher Education (Planungsausschuss für den Hochschulbau) established in 1970 on this legal basis became the decisive body for quantitative planning in higher education, presenting annual recommendations.

In November 1969, the former Federal Ministry for Scientific Research was renamed the Federal Ministry of Education and Science, supplemented by the establishment of an additional Department of Educational Planning. In 1970, federal and state governments signed an agreement providing for the establishment of a Federal-State Commission for Educational Planning (Bund-Länder-Kommission für Bildungsplanung), (BLK) and the federal government announced a draft version of the Framework Act for Higher Education.

In 1969/70 a breakthrough of a high-growth higher education policy could be observed. As Table 12 shows, the growth rates of expenditures on higher education surpassed that of the GNP and of the public expenditures in general.

In June 1970, the Science Council announced its recommendations on the quantitative and structural development for the following decade. It expected an enrolment ratio of 25 per cent of the corresponding age group for 1980 and an increase in the total number of students (including teacher colleges, Fachhochschulen,etc.) from 438,200 in 1970 to 846,500-988,300 in 1980. It encouraged a stronger occupational orientation of higher education and the increase of short-cycle higher education; according to its estimates the tripling of the percentage of the GNP spent on higher education seemed to be necessary within a decade.

Today, many observers claim in retrospect that in 1970 the public opinion in the Federal Republic of Germany, the advisory bodies, and most politicians as well, were in favour of an almost indefinite expansion of academic secondary education and higher education and they believed that this expansion would meet the requirements of the occupation system. It can be shown however that this was misleading.

---

[1] Bundesminister für Bildung und Wissenschaft, Jahresbericht 1969, Bonn, 1970, p.6.

Table 12. Development of GNP, Educational expenditures and expenditures on higher education 1961-1981

		Educational expenditure		Expenditure on Higher education	
Year	GNP Billion DM	Billion DM	Per cent of GNP	Billion DM	Per cent of GNP
1961	332.6	9.0	2.7	1.7	0.5
1962	360.1	10.2	2.8	2.1	0.6
1963	384	11.7	3.0	2.4	0.6
1964	420.9	13.8	3.3	2.9	0.7
1965	460.4	15.7	3.4	3.5	0.8
1966	490.7	17.0	3.5	3.7	0.8
1967	495.5	17.8	3.6	4.0	0.8
1968	540.0	19.1	3.5	4.4	0.8
1969	605.0	22.2	3.7	5.3	0.9
1970	685.6	27.6	4.0	6.9	1.0
1971	761.9	34.7	4.6	8.4	1.1
1972	833.9	39.1	4.7	9.4	1.1
1973	926.9	44.5	4.8	10.7	1.2
1974	995.7	52.6	5.3	12.6	1.3
1975	1 033.9	56.8	5.5	13.6	1.3
1976	1 125.0	58.1	5.2	13.8	1.2
1977	1 200.6	60.4	5.0	14.3	1.2
1978	1 290.7	64.7	5.0	14.9	1.2
1979	1 398.2	69.9	5.0	16.0	1.1
1980	1 491.9	77.0	5.2	17.7	1.1
1981	1 551.9	80.6	5.2	18.6	1.2

Source: Based on H. Peisert and G. Framheim, Systems of Higher Education: Federal Republic of Germany, op.cit., p.201; Bundesminister für Bildung und Wissenschaft, Grund- und Strukturdaten 1982/83, op.cit., p.210 and 242.

Employers' representatives continued to conjure up the danger of an academic proletariat. Also, the manpower requirement forecasts of the late sixties had caused a heated debate among researchers and politicians. Several state governments were reluctant from the outset to support the abovementioned proposals of 1970.

3.4 Years of disputes on structure, finances and prospects of graduates (1971-1975)

The short period of setting far-reaching goals of expansion was followed by years of disputes on educational policy. It took the BLK three years to find, finally in 1973, a compromise on quantitative and structural planning of the education system for the period until 1985. The debate on the Framework Act for Higher Education lasted five years, and it was finally enacted in December 1975.

It was obvious that the quantitative and structural goals set by the highest advisory bodies and the federal government had not been based on a compromise fully worked out among all the major political parties and powerful social groups. The measures taken to strengthen higher education planning at the federal level required a high degree of consensus among the federal government and the states' governments: for decisions of any sort a consensus of the federal government and more than two-thirds of the states' governments is a prerequisite. But even the decisions thus agreed upon are not necessarily binding for all the involved governments. As the Social Democratic Party and the Free Democratic Party together had formed the federal government since 1969 and the opposition party at the federal level gained the majority of the states' governments in the early seventies, lack of consensus was prevalent. Major decisions, such as the admission policy and the voting rights of professors in university commissions, were not made by the political or legislative authorities but by the Federal Constitutional Court. Further, it soon became clear that most of the supporters of the proposed reforms were frightened of the costs involved. Finally, the development of higher education in relation to the labour market during the early seventies meant that the positions of those in favour of far-reaching expansion goals and reforms in higher education would weaken.

As to the quantitative development of higher education, the BLK finally recommended in spring 1973 an expansion in the capacity of higher education sufficient to enroll in 1980 the share of 20-22 per cent beginner-students of the corresponding age group, instead of 25 per cent recommended by the Science Council. The target set by the BLK for 1985 was 22-24 per cent.

Two years later the Planning Committee for Construction in Higher Education further levelled down the targets: Instead of the capacity for about 1 million students in 1985, it was decided to create facilities for 850,000. The number of students had grown from 510,000 in 1970 to 850,000, and was still expected to rise even further as this plan was published. According to the Science Council, three arguments had supported this decision:

"- The present target values exceed the present financial capacity of the federal government and the states.

- The target values do not sufficiently take into account the birth rate and its effect on the number of student applicants and students after 1985.

- ... the number of graduates from institutions of higher education would be out of proportion to the labour market".[1]

Due to the economic difficulties since the autumn of 1973, the planning committees tended to be more cautious as regards financing of higher education and the labour market prospects of graduates. In the public debate, however, the demographic argument was given priority: As the live births had declined since the mid-sixties, facilities created beyond the proposed target would not be used any more in the nineties. Instead, the peak number of students' ought to be "tunnelled" in the eighties by 120 and 160 per cent.

During the early seventies the debate on quantitative planning in higher education focussed on the admission policy. Article 12 of the Constitution, stating that everyone has the right to choose freely a profession, a work place and an institution of education, had for a long time been interpreted as the absolute right of students completing the academic track of secondary education to enroll at any university in any field. The states, however, hesitated to provide facilities according to social demand, especially in those fields where the unit costs proved very high. In medicine, where the costs for one student are twelve times as high as in social sciences, numerus clausus began in 1963, but the restriction spread rapidly to other subjects during the early seventies. In July 1972 the Federal Constitutional Court made public a decision on numerus clausus. The judgement in effect represented a compromise between the demands of open university admission for qualified applicants and restricted admission due to financial and manpower notions. The court determined that restricted admission was justified only provided the existing facilities were utilized to the fullest extent; other necessary government tasks would suffer too much from the financial burden of higher education and the development of higher education would contradict manpower requirements, as far as these can be clearly determined.

---

[1] Peisert and Framhein, op.cit., p. 74.

In October 1972, the states signed a treaty on the distribution of places for study. It was fixed that - aside from certain quotas for foreigners and for hardship cases - 60 per cent of the places in numerus clausus subjects would be awarded on grade-point average of school certificates and 40 per cent according to waiting time after the completion of secondary education.

Although expectations of an oversupply of university graduates played a rôle in reducing the targets of higher education expansion, higher education policy did not primarily intend to reduce the number of graduates even after the economic problems showed up in 1973. Rather, the compromise fixed in the Framework Act for Higher Education in 1975 called for a more effective utilization of the facilities in order to offer a larger number of people the opportunity to study under given financial constraints.

The political and planning agencies agreed to promote the expansion of short-cycle higher education. The BLK for instance suggested that the number of beginner-students in three-year courses ought to increase from about one-quarter to about one-third of all the beginner-students in 1985. However, the percentage remained more or less constant during the seventies at about 26-27 per cent. The up-grading of former higher vocational schools to non-university level institutions of higher education did not make these institutions much more attractive, but rather caused a serious identity crisis. The institutions neither kept their traditional strength - the occupational experience preceding this semi-professional education, highly appreciated by employers - nor reached the often desired goal of offering an academic education close to that of the universities.

The federal government and the Science Council therefore proposed in the mid-seventies establishing three-year courses in universities. They hoped that in this way the number of fields of studies offering short-cycle courses could be more easily enlarged and that the short-cycle course would gain more attraction. The Framework Act for Higher Education supported such models. These proposals were given priority only after one major aim of higher education reform, which was considered essential around 1970, had been given up: to integrate university-level and non-university level higher education in comprehensive universities (Gesamthochschulen). The idea of setting up comprehensive universities in order to upgrade short-cycle higher education was to ease the transfer to university education and to confront both the traditional principles of research-oriented teaching at universities and the vocation-oriented education at the higher vocational schools.

Very soon, however, the desire gained ground again to retain distinct types of higher education courses. In 1975, only four per cent of the existing institutions of higher education had been named comprehensive universities and enrolment figures equalled only six per cent of the total for higher education.

In 1975, a further cut-back of reform goals seemed to be likely in the near future, as well as a further decline of the targets of study places; and there were rapidly growing problems of graduates on the labour market. In 1975 and spring 1976, private and public employers, the Federal Association of German Employers (Bundesvereinigung der deutschen Arbeitgeberverbände) and the Conference of the Ministers of Finance (Finanzministerkonferenz) made public a number of most pessimistic forecasts about the mismatch of supply and demand for highly qualified labour ever made in the Federal Republic. According to these forecasts, only about one-third of the graduates of institutions of higher education in the eighties would be able to find suitable jobs.

3.5 Signs of adjustment towards high numbers of students and graduates (1976-1982)

Contrary to the expectations prevailing around 1975 that conflicts stirred up by the expansion of higher education would grow, the development in the Federal Republic of Germany since 1976 showed actually remarkable signs of adjustment towards the high number of students at institutions of higher education. This was also true for the large share of the labour force trained at institutions of higher education. The tone of the debate remained harsh, but the different views converged somewhat and many more compromises were reached on higher education and manpower planning than in the early seventies.

As regards admissions to higher education, the mismatch between applicants and study places grew at such a fast rate that in 1974 a complete numerus clausus was predicted for 1976. However, this did not in fact materialize. Complaints were heard about the unbearable pressure for achievement in schools. Also, the admissions situation grew absurd with the rising number of students; in the most serious cases, applicants had to wait seven years before they could enroll. Finally, in February 1977, the Federal Constitutional Court raised again its voice on principles of university admissions, repeating its view that the right for qualified secondary school-leavers to enroll had to play a more dominant rôle in admissions. It refuted the notion that the introduction of admission tests would be able to justify the numerus clausus more readily.

At a conference held in winter 1975/76 (under the sponsorship of the Foundation for German Research, an organization close to employers) with the purpose of re-opening the dialogue on education between influential political and social groups[1], the demographic argument found a reversed application. It was argued that an undersupply of educational facilities during the peak period would lead to "displacement" processes in vocational education. Thereby those not having a chance to enroll would turn to vocational education below the college level; finally a growing number of main school students would be excluded from any vocational training whatsoever. Therefore it was felt that an opening up of all institutions of education and training courses was necessary in order to guarantee at least some vocational education to all those wanting to be trained. These arguments were met with a surprisingly favourable response. All the political parties, as well as major planning and advisory groups, employers and trade unions and most of the bodies and groups representing the interest of institutions of higher education, their staff and students, agreed that a policy of "opening up of universities" (Öffnung der Hochschulen) ought to be chosen, reducing admission restrictions as well as accepting temporary overcrowding of the institutions of higher education.

In 1977, the federal and states' governments agreed formally upon an action programme. Among others, they prepared measures to reduce numerus clausus, to increase expenditures on higher education, to reform curricula, to improve counselling and to better the job opportunities of college graduates. At that time, the debate on manpower requirements began to show at least some signs of turning away from extremly divergent positions. As regards the theories and methods of requirement forecasts and their utility for planning, the view became popular that forecasts might be an important information basis provided they do not only rely on estimates of economic growth but also on surveys on the utilization of labour, on alternative models of socio-political goals and developments as well as possible substitution processes in the labour market. As for the views on the future of graduates, both the arguments of a growing academic proletariat and the expectations that a full utilization of the competences of the rising number of students was likely, were now seldom stated.

Instead, debates concentrated on the question of which substitution processes were likely, and which desirable.

---

[1] Stifterverband für die Deutsche Wissenschaft, Schülerberg und Ausbildung, Stuttgart, Klett 1976.

Disputes continued about possible frictions in the labour market and the consequences of upgrading processes. Critics of the expansion of higher education argued, for instance, that most graduates face the prospect of inappropriate jobs. According to their view, not only the expectations of the graduates will be disappointed, but also those not enrolling at institutions of higher education suffer because many of them would be "displaced" by persons with a higher educational level. Also debate arose whether a "de-coupling" of the education system from the occupation system was necessary and desirable in order to cope with the rising number of college graduates. But at least adaptation processes towards changing relationships between higher education and employment were considered more likely than some years before, in spite of the less favourable economic conditions of that time.

In the course of this development some consensus could be reached with the argument that, no matter whether the expansion of higher education was desirable or not, some coordinated measures must be taken in order to reduce the frictions of the labour market caused by the rising number of graduates.

A remarkable shift could be observed insofar as the statements of private employers' representatives on the recruitment policy of companies were concerned. Until the mid-seventies complaints about an oversupply of graduates dominated, but in the late seventies most employers' representatives argued that the growing number of graduates could be absorbed provided the students would level down their expectations and become more flexible, that curriculum reform took into account the needs of the economy, and that a clear-cut difference between university education on the one hand and vocationally-oriented short-cycle higher education at Fachhochschulen on the other would be preserved.

In general, the mood for compromises in educational policy grew in the late seventies in spite of overt controversies, and it seems justified to point out three major reasons for this. Firstly, the fear was growing among politicians engaged with matters concerning education that further political deadlocks would increase the difficulties for the education system in general; it had lost its short-lived status of high political priority anyway, and continuous disputes would strengthen the inclinations to further reduce the expenditures for education in general. Secondly, it was felt that the dispute on educational reforms and on the mismatch of education with employment tended to discourage a whole generation. The view became widespread that growing apathy and desperation amongst youth might be more detrimental than sub-optimal manpower planning. Thirdly, the development of the system of higher education itself disappointed to a great extent the high expectations

Table 13. *Synopsis of projections of expansion of higher education*

	BLK[+] 1973	BLK[+] 1979	KMK[++] 1982
a. Beginner-students (in 1,000)[1]			
1980	187 - 206	182	(194)
1985	224 - 245	222 - 250	248 - 256
1990		187 - 225	220 - 231
b. Enrolment quota of corresponding age group (%)[1]			
1980	20 - 22	204	(24.0)
1985	22 - 24	22.8 - 25.6	24.6 - 25.4
1990		23.0 - 27.7	31.2 - 32.9
c. Percentage of beginner-students at Fachhochschulen[2]			
1980	30	41	(29)
1985	34	ca. 40	30
1990		ca. 41	28
d. Total number of students (in 1,000)[3]			
1980	818 - 867	946	(1,044)
1985	965 - 1 047	1 104 - 1 168	1 292 - 1 316
1990		1 049 - 1 209	1 329 - 1 382

Source: Bund-Länder-Kommission für Bildungsplanung, *Bildungsgesamtplan*, Vol.I, Stuttgart: Klett, 1973, pp.43-45; Bund-Länderkommission für Bildungsplanung und Forschungsförderung, *Fortschreibung des Bildungsgesamtplans* (Bildungsgesamtplan II), Entwurf Stand Juni 1979, Bonn 1979, mimeogr.; Sekretariat der Ständigen Konferenz der Kultusminister in der Bundesrepublik Deutschland: Entwurf: *Prognose der Studienanfänger, Studenten und Hochschulabsolventen bis 1995*, Bonn 1982, mimeogr.

[1] Only German students. [2] Only German students; three-year courses in 1973, courses at *Fachhochschulen* in 1979

[3] Including foreign students [+] BLK: Federal State Commission for Educational Planning and Research Promotion.

[++] KMK: Permanent Conference of the Ministers of Culture in the Federal Republic of Germany.

BEST COPY AVAILABLE

for sweeping reforms as well as desires to preserve the traditional system. In general, debates in institutions of higher education and in the public became more moderate.

In 1979, the Federal-State Commission on Educational Planning and Research Promotion presented the draft of its Second Comprehensive Plan for Education. As *Table 13* shows, the *BLK* foresaw a slightly higher quota of beginner-students among the corresponding age group in 1985 than in its previous plan published in 1973: 22.8-25.6 per cent instead of 22-24 per cent. For the year 1990, the *BLK* estimated an increase in the quota up to 23.0-27.7 per cent. Also the estimates of the total numbers of students in 1985 were about 10 per cent higher in the 1979 plan than in the 1973 plan. It should be noted, however, that the *BLK* foresaw an extremely rapid increase in enrolment at *Fachhochschulen* after 1978.

The projection made in 1982 by the Permanent Conference of the Ministers of Culture (KMK) gives a higher enrolment quota for 1985 and 1990 than the *BLK*. The total number of beginner-students is also higher. However, the percentage of beginner-students at *Fachhochschulen* is estimated to be lower.

The *BLK* proposals showed that the concern about the growing numbers of students had toned down during the late seventies. The educational planners at federal and state level, after some years of concern about how to cope with the numbers of secondary school leavers, had opened up the debate again on extending functions of higher education, especially in the field of further education.

It deserves observation for the time being whether these compromises, obviously not sustained by a basic consensus on education and manpower matters will last very long. The new Christian-Democratic and Liberal federal government of 1982 indicated some shift of emphasis towards limitation of expansion but - except for transforming grant scholarships into loans - did not take far-reaching actions in this direction during the first year of office.

4. REQUIREMENT FORECASTS AND RESEARCH ON HIGHER EDUCATION AND EMPLOYMENT

4.1 Development of forecasts

The development of the forecasts on the demand and supply of college graduates can be divided into three stages: The first global forecasts in the early sixties, the forecasts around 1970, mostly following minutely the manpower requirement approach, and finally the forecasts in the mid-seventies which took up some of the objections raised against the "classical" manpower requirement approach.

The first global forecasts on the demand for university graduates were based on the assumption that the Federal Republic of Germany was lagging behind in the international expansion of secondary and higher education. In 1962, Edding published a study based on the correlation approach. Assuming a parallel development of the enrolment quota at institutions of higher education and the GNP per capita, he called for a doubling of the number of students within two decades. One year later the Permanent Conference of the Ministers of Culture presented a prediction of the demand for school teachers until 1970. An acute undersupply of teachers was expected mainly due to the increasing number of pupils. An alternative model for the case of a lower student/teacher ratio was also presented, but there was scepticism that this aim could be reached in a period of growing pupil numbers.

The late sixties until the early seventies was the second period of requirement forecasts; a series of prognoses were produced based on the manpower requirement approaches. As for data on the educational attainment of the labour force, they relied in most cases on the census data of 1961. The first publication (1967), and the best known of them, carried out by H. Riese[1], came to the conclusion that the number of students was growing at a far faster rate than requirements; indeed, it was predicted that by 1981 there would be about twice as many graduates as job openings for people with their qualifications. Riese assumed that the quota of university graduates within each occupational group would remain constant from 1961 until 1981.

---

[1] Hajo Riese, *Die Entwicklung des Bedarfs an Hochschulabsolventen in der Bundesrepublik Deutschland*, Wiesbaden, Steiner, 1967; also Hüfner, Köhler and Naumann, *op.cit.*, pp. 67-72.

Three further forecasts of the requirements of highly qualified manpower in all occupational groups were also based on the manpower requirement approach, but somewhat different in method. For example, Krafft, Sanders and Straumann[1] took into account the socio-economic factors of different regions, but their results as to the total number of university-trained manpower to be required around 1980 did not vary to a large extent.

The forecasts of this second period provoked a large number of criticisms. Objections were raised as regards the theoretical and political implications as well as the methods applied in the requirement forecasts. Among others, it was argued that the supply of qualified labour at the present ought not to be considered sufficient and that higher ratios of college-trained labour were likely to be needed within many occupational groups. Some critics pointed out the uncertainty of future development and other systematic imperfections of manpower planning. Also, that no allowance was made for horizontal substitution processes or the absorptive capacity of the labour market. Further, it was argued that a higher supply of graduates might have innovative effects on the organization of work and productivity, and thus modify the demand. Besides, the forecasts were considered misleading, for they did not take into account the rôle of social demand in education policy, possible political programmes to utilize highly qualified manpower and the benefits of education for culture and society in general.

---

[1] Alexander Krafft, Hermann Sanders and Peter R. Straumann, Hochqualifizierte Arbeitskräfte in der Bundesrepublik Deutschland bis 1980: Sozio-ökonomische Analyse und Prognose, Bergisch-Gladbach: Bundesminister für Bildung und Wissenschaft, 1971 (Schriftenreihe Hochschule, No.6); Laszlo Alex et al., Angebot und Bedarf an hochqualifizierten Arbeitskräften in der Bundesrepublik Deutschland bis 1980: Arbeitskräftebilanz und Intensivanalyse, München: Gersbach, 1972; Wolfgang Jeschek, Projektion der Qualifikationsstruktur des Arbeitskräftebedarfs in den Wirtschaftsbereichen der Bundesrepublik Deutschland bis 1985, Berlin: Deutsches Institut für Wirtschaftsforschung, 1973.

Requirement forecasts published in the mid-seventies took somehow into account the criticisms; they tended to show the following modifications:

- to proceed from various political objectives as regards to education, labour market and economy, and to present corresponding models of the consensus expected in terms of demand and supply of graduates;
- to incorporate surveys on employers' views as regards to the present utilization or future demand for highly qualified manpower,
- to estimate the possible range of requirements due to potentials of flexibility on the part of the employers' and of the labour force.

Many of the forecasts came to the conclusion that, according to more cautious expectations on future development, a remarkable oversupply of graduates could be predicted, but if substitution processes play an important rôle in the future, and active policies as regards to economic development and labour market were to be chosen, there would not be any oversupply. Although the debate continued about the utility of such forecasts, in the seventies the number of politicians and researchers seems to have grown who supported the view that such forecasts were one of several valuable sources of information, provided their predictive validity was not overestimated.

However, it is doubtful whether these studies have been of any substantial help in government planning on higher education or even whether they have been able to make such planning more sophisticated. For the more complex the models became, the harder it was for them to produce results that could serve as legitimization for specific political decisions. On the one hand, it has become exceedingly difficult to judge the extent to which the resulting data are determined by the complex assumptions on which the model is based, and on the other hand, reference to substitution processes and alternative policies has the effect of "passing the buck" back to the planners. When it is estimated, for example, that the maximal requirements for law graduates is 3.7 times as high as the minimal requirements, it can only serve as a demonstration of the fact that a sophisticated forecast can hardly be a forecast at all.

4.2 Research approaches on higher education and employment

As mentioned above, the manpower requirement approach had provoked much criticism in the Federal Republic of Germany. Subsequently, some of these critical arguments had influenced the hypotheses of a number of research projects on higher education and employment in the country. First of all, criticism was made as to the assumption of the manpower approach in which a certain stage of economic development was supposed to correspond closely to a certain pattern of manpower. Many studies now examined alternative relationships between the education and the occupation systems and analysed the variety of factors causing a change in occupational requirements. Among others, studies on higher education and the employment system of foreign countries played some rôle in these considerations.

Second, it was now widely assumed that better knowledge of the qualitative inter-relationship between higher education and work would help explain the necessary and appropriate relationship between higher education and employment, and thus eventually reveal possible alternatives. Research on the labour market which tried to overcome this lack of information was carried out now on the nature of work, requirements, competences, curricula and learning processes.

Three types of surveys could be found quite frequently, sometimes combined in one study:

(a) Surveys on the relationship between educational attainment and occupation(of the total labour force or its segments): Such studies would be made in order to find out, for example, what career perspectives the graduates of certain fields of study have, or how absorptive and flexible the employment system is.

(b) Surveys on educational and occupational biographies: They render more importance to the analysis of, for example, occupational choice, the evaluation of one's studies and their impact on the career, problems of adjustment in the working life, the impact of education on the career, career patterns, etc.

(c) Surveys on occupational requirements and outcomes on higher education: Such surveys analyse employers' or graduates' understanding of job tasks and the requirements involved and relate their findings to the curricula in higher education. Or they ask graduates to assess the utility of their studies for their work etc.

There are quite a variety of underlying concepts in research on higher education and employment. Six main directions have been identified in respect of these concepts and approaches, which are summarized below:

-The first of such approaches which enjoyed wide attention was the human capital theory. It dominated economics of education and research on higher education and employment in general until 1970. The basic set of assumptions on the rôle of education in economic growth did not only shape the manpower requirement forecasts, but also research projects on the job tasks of graduates. In many cases the inability of graduates to cope with certain tasks were studied in order to use them as the basis for recommendation of further necessary additions to the curricula in higher education.

- Criticism of the theoretical, methodological and political implications of the manpower requirement forecasts led to the development of the so-called absorption approach. It focusses on the question: under what conditions can the occupation system absorb growing numbers of graduates, and how would this affect recruitment, occupational structure, the development of occupational rôles, etc.?

- The flexibility approach concentrates mainly on substitution processes and determinants of occupational flexibility. One method is latent substitution, measured by questioning employers about the extent to which jobs in their area of responsibility could be carried out by persons having a different training and educational level to those presently employed. The substitution as it actually takes place (realized substitution) is established by inquiring into the predecessor's and successor's training. This phenomen is discussed in more detail later. Requirement forecasts also make use of this type of calculation, whereby data on substitution processes are used as a basis for adding estimates of minimal and maximal demand to the conventional prognosis. In addition, proponents of this flexibility approach suggest that training be changed in order to make graduates more flexible in regard to the employment they can assume.

- A fourth direction in research has to do with strategies within enterprises to utilize qualifications. It was shown that enterprises might be very responsive to available manpower. Most of the studies based on this approach, however, did not touch upon college-trained labour.

- A fifth direction for research is concerned with investigation into the interrelation between technological development, the rationale of the socio-economic system and the organization of work. In contrast to those studies which only stress technological developments and the organization of work, this approach proceeds from the assumption that employers' interest in maximizing their profit has a great deal to do with the way rationalization is carried out in a given enterprise. In addition studies have been carried out on the historical features of occupations and their impact on the division of labour and, subsequently, on the perception of the manpower requirements.

- The sixth and final approach comprises studies that stress the selective or status distributive function of education. Analyses of the political decision-making process, requirement notions and recruitment strategies, among others lead one to support the conclusion that during the course of the expansion of higher education the tendency in recruiting graduates and in revamping the structure and curricula of higher education has differed from fixed notions about which qualifications are needed. Instead, more and more effort has gone into selection and into maintenance of social hierarchy and its legitimization.

In summarizing the research on higher education and employment in the Federal Republic of Germany, it can be said that the efforts have brought three major contributions to the debate. First of all, the results of the research reinforced sceptical views on the arguments about manpower requirements. Second, it has created awareness of some characteristics of the preparatory functions of higher education for employment in the Federal Republic of Germany, for example the promotion of specific qualifications, and also possible alternatives. Third, it has contributed to a shift of emphasis from quantitative to qualitative aspects of the relationship between higher education and employment. This last aspect is dealt with in more detail in the following section.

5. "QUALITATIVE" RELATIONSHIPS BETWEEN HIGHER EDUCATION AND WORK

5.1 The concept of "Qualifikation"

In this section, we present an overview of various approaches, methods and findings of research conducted in the Federal Republic of Germany on the "qualitative" relationships of higher education and work and discuss their implications for higher education policy and planning. The term "qualifikation" is used in German in linking content and processes of education, the acquisition of knowledge and development of competences potentially useful for one's future job and the job requirements.

5.1.1 The impact of concepts regarding other levels of education

Problems of relating higher education to the work of graduates were traditionally left to the scholars and professionals of each field or to the respective employers. Experts' committees of scholars tend to claim that they know how to integrate the content, sequences and methods of instruction with the inner logic of their discipline.

As opposed to it, concepts of "qualifikation" implicitly claim that the insight and experience of experts in respective fields of knowledge or occupations are insufficient to understand the substantive relationships between education and work. In addition, expertise on the organization of work, job analysis, teaching and learning processes, curriculum development, learning psychology, etc., are needed to analyse qualitative problems of the education/work link and to suggest innovations.

When politicians, planners and scholars began to pay more attention to the qualitative relationships between higher education and work, they also began to examine the concepts of "qualifikation" which previously had addressed the education/work linkages at lower levels of education. Two fields of knowledge have to be mentioned in this context:

- Industrial sociology as well as some sub-fields of business administration.
- Curriculum development in the field of pedagogy.

An overview made in 1978 of major categories for classifying dimensions of "Qualifikation" (see Figure 2) indicates the variety of concepts and the rôle played by research traditions mentioned above[1]. The traditions of research on "Qualifikation" helped to develop analytical tools, although more than a simple process of adaptation was needed because the higher the educational level the more difficult it is to adapt the graduate to the job tasks. In addition, research on "Qualifikation" regarding other levels of education helped the newly emerging research on higher education/work linkages to avoid the pitfalls of establishing "requirements" in a very simplistic way, e.g. overlooking the time span from the acquisition to the utilization of knowledge, labour market problems of narrowly specialized persons, transfer of learning, impact of the division of labour and political dimensions of the notion of "requirements" etc.

5.1.2 Concepts of "Qualifikation" regarding highly qualified manpower

In the Federal Republic of Germany, research on the qualitative relationships between higher education and work has been substantially influenced by research on "Qualifikation" regarding other educational levels, but in addition attention was paid to some aspects which did not play a major rôle in research on other educational levels. Some of these are explained below:

(a) "Qualifikation" concepts tend to perceive the employment system as the active part which determines "requirements", and the education system as the reactive part which has to provide the skills needed. As opposed to this dominant view, higher education might play an innovative rôle for the employment system. Therefore, some scholars concluded that research on "Qualifikation" has (at least for highly qualified manpower) to analyse both job requirements and the corresponding supply of skills as well as the way unexpected supplies are absorbed and utilized in the employment system.[2]

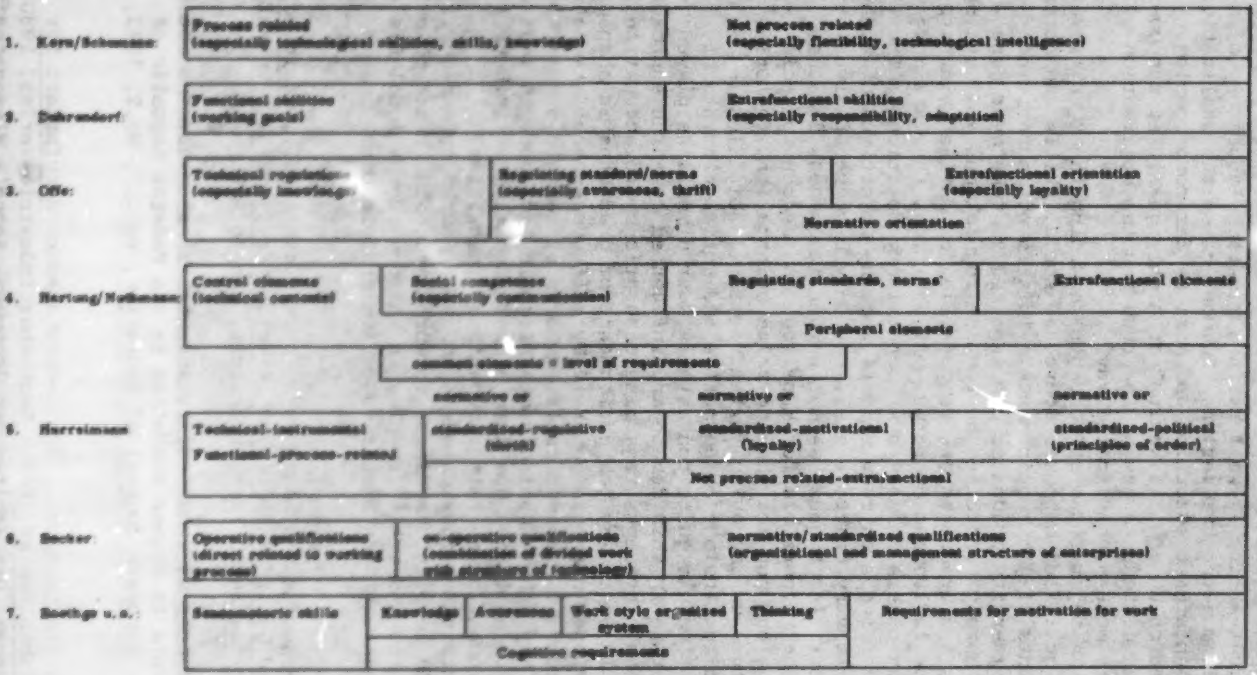
(b) The correspondence of training and job requirements can be observed easily if the job tasks are not very complex or if learning processes and job tasks are similar, for example planning and conducting a laboratory experiment in a chemistry

---

[1] Cf. the overview provided by Helmut Winkler, General and Technical - Didactic Principals in Industrial Education, Chungnam: CNU, 1981, p.53.

[2] Wolfgang Armbruster et al., Expansion und Innovation, Berlin: Max-Planck-Institut für Bildungsforschung, 1971.

Figure 3. An overview of concepts of "Qualification"



1. Kern/Schumann:
Process related
(especially technological abilities, skills, knowledge)
Not process related
(especially flexibility, technological intelligence)

2. Dahrendorf:
Functional abilities
(working goals)
Extrafunctional abilities
(especially responsibility, adaptation)

3. Offe:
Technical regulation
(especially knowledge)
Regulating standard/norms
(especially awareness, thrift)
Extrafunctional orientation
(especially loyalty)
Normative orientation

4. Hartung/Nuthmann:
Control elements
(technical contents)
Social competence
(especially communication)
Regulating standards, norms
Extrafunctional elements
Peripheral elements
common elements = level of requirements

5. Harrsimann
Technical-instrumental
Functional-process-related
normative or
standardized-regulative
(thrift)
normative or
standardized-motivational
(loyalty)
normative or
standardized-political
(principles of order)
Not process related-extrafunctional

6. Becker:
Operative qualifications
(direct related to working process)
co-operative qualifications
(combination of divided work with structure of technology)
normative/standardized qualifications
(organizational and management structure of enterprises)

7. Baethge u.a.:
Sensomotoric skills
Knowledge
Awareness
Work style organized system
Thinking
Cognitive requirements
Requirements for motivation for work

BEST COPY AVAILABLE

course at university as well as in a research laboratory of a chemical firm after graduation. In most cases the qualitative link between higher education and work is far more complex. Thus, research on "Qualifikation" of highly qualified manpower has to find methods to assess the need and the utilization of skills in a more sophisticated way[1].

(c) A major focus of concepts regarding the "Qualifikation" of highly qualified manpower addressed social skills and normative elements of job requirements. This is not surprising because university graduates are expected to take over jobs which are barely controlled by routine regulations and working procedures and graduates are responsible for duties which are prone to be influenced by norms. In addition, they are more likely than others to take over supervisory positions. The debate regarding such requirements and the objectives of higher education is very controversial, not only because of diversity of norms but also because German universities consider themselves to be responsible for knowledge and search for scientific truth, but not for shaping value orientation, fostering civil virtues or improving "extrafunctional abilities".[2]

The terminology on normative and social elements of "Qualifikation" is quite confusing. Four dimensions played an important rôle in this debate and influenced research approaches:

- Basic concepts regarding occupations and occupational identity: In which way job performance of graduates is shaped by professional norms in general? By self-concepts of graduates as intellectuals, professionals, members of certain occupational groups or any other distinct sets of goals and concepts regarding one's own occupation? How does higher education contribute to the development of certain occupational identities?
- Attitudes towards one's job as expected by employers, for example loyalty, readiness to work hard, etc. What rôle do such norms and attitudes play in various occupational fields and in which way does higher education promote them?[3]

---

[1] See the assessment of methods by Dirk Busch et al., Tätigkeitsfelder und Qualifikationen von Wirtschafts-, Sozial-, Ingenieur- und Naturwissenschaflern, Frankfurt: Campus 1981.

[2] On the debates of study reform see Ulrich Teichler, "Recent Developments in Higher Education in the Federal Republic of Germany", European Journal of Education, Vol.17, No.2, 1982, pp. 161-176.

[3] Cf. Georg von Landsberg, Trainee-Programme: Berufsstart für Hochschulabsolventen, Köln: Deutscher Industrie-Verlag, 1980; Eckart Liebau, Der Habitus der Ökonomen, Kassel: Wissenschaftliches Zentrum für Berufs- und Hochschulforschung, 1982.

- Social skills in terms of knowledge of the social organization of work and the ability to master the social relations surrounding professional work, for example leadership, ability to co-operate, to understand the organizational conditions of work and act correspondingly etc.

- A competence for acting in social settings ("soziale Handlungskompetenz") in terms of perceiving one's own rôle in patterns of authority and power within the organization of work, understanding the sequence of careers, and the conditions to be promoted, noticing typical conflicts, shaping one's job rôle etc.

(d) A major debate focusses on the political dimensions of "requirements". Notions of "job requirements" differ substantially, if the graduate is expected to perform a given job in a given organizational setting or he is expected to reflect on the deficiencies of the organizational setting and urge changes. There are political implications if one expects an engineer to develop a technological innovation or if one expects him to understand environmental and social consequences of the application of that technology.

(e) Finally, some scholars suggested taking into account the problems of differentiation of occupations and the division of labour between various job rôles. Occupational differentiation which leads to job rôles of medical doctors on the one hand and psychologists on the other hand might help to treat physical as well as mental problems separately in a more efficient way, but at the same time might lead to inappropriate treatment of interactions between physical and mental problems. The job requirements of a nurse in the Federal Republic of Germany are less demanding in terms of professional medical competencies than in many other industrialized countries.

These examples of issues and concepts regarding the qualitative relationship between higher education and work in the Federal Republic of Germany first of all show that it is very difficult to determine "requirements". They also demonstrate that the concepts of "Qualifikation" reflect the controversies about socio-political implications of goals and objectives of higher education. Finally, one can note that concepts of "Qualifikation" regarding higher education reflect the debate on whether the expansion of higher education leads to "overeducation" ("Überqualifikation") or results in a more competent performance of job tasks, in innovations as well as in possibilities to redesign the job rôles in a way which might provide better results as well as more satisfactory work.

5.2 Research methods employed in analysing "Qualifikation"

5.2.1 Research instruments and major goals of research

Studies analysing "Qualifikation" of highly qualified manpower did not employ one important instrument otherwise used: observation of work. The complexity and limited visibility of the work of university graduates made other procedures necessary. Most analyses in the Federal Republic of Germany are based on the replies to written questionnaires and interviews, both expecting quick responses to questions and statements. Only a few questionnaires asked for a detailed description and assessment of work tasks and only a few researchers included group discussions or narrative interviews in order to stimulate information in a less direct way. Most surveys did not exclusively focus on "Qualifikation", the substantive relationships between job requirements on the one hand and the acquisition of knowledge on the other, but were rather general surveys on educational and occupational careers. They included search for jobs, various typical variables of labour market research, e.g. career paths, income, mobility etc., job satisfaction and other topics. Questions regarding "Qualifikation" might comprise between a quarter and half of such surveys.

This section has given an overview of major topics, the questions asked, statements given or categories of replies - the instruments for analysing these topics - as well as some findings, in order to illustrate the methods and their contribution to the understanding of "Qualifikation", whereas the next section will pay attention primarily to research findings,

5.2.2 Functions and activities

Manpower requirements studies in the Federal Republic of Germany generally took into consideration employment according to economic sectors as well as occupational groups. Surveys on graduates frequently include further measures in describing the jobs and job tasks of the graduates.

Many surveys ask the graduates about the functional divisions or departments within the enterprise which they belong to. This might be a better indicator than classifications of occupational groups.

According to one survey, divisions can be classified according to prestige:

- Departments of low prestige: production, preparation of production, control etc.
- Departments of intermediate prestige: research and development, construction etc.
- Departments of higher prestige: management, general administration and sales department.

Of the engineering graduates holding a university degree who were questioned, 27 per cent were working in the high prestige sector as compared to 17 per cent each of short-cycle graduates and engineers without college education.

The Institute for Labour Market and Occupational Research developed a list of major work tasks applicable for all occupations. The list has been employed in many surveys. For example social workers rated most highly in

- Social services,
- Contact with clients,
- Advice and counselling,
- Teaching,
- Nursing.

They rated extremely low in computer programming, repairing, selling etc.[1]

One research team conducted several studies on the work of graduates by asking them to provide detailed information on major activities - two each day for a period of 10 days. They were asked in the case of public administration

- to describe the activity briefly,
- to estimate the time span,
- to name the number of persons they communicated with as well as the function and the educational level of these persons,
- to classify the kind of activities according to broad areas (e.g., school administration) as well as more detailed categories (e.g., school curricula),
- to indicate the type of results (for example preparation of general rules and directives) expected,
- to describe the activity (examining facts, decision-making etc.)
- to identify who initiated the activity,
- to indicate the means of communication (reading, telephoning etc.)
- to mention which fields of knowledge (civil law, psychology, organization matters etc.) were employed[2].

This analysis provided much more complex information about activities of graduates. But these were self-selected activities which might not be typical for the overall job tasks.

---

[1] Manfred Kaiser, "Der Arbeitsmarkt für Sozialarbeiter und Sozialpädagogen," part II, Nürnberg/Berlin, 1980, mimeo., p. 25 a.

[2] Gerhard Brinkmann, Wolfgang Pippke and Wolfgang Rippe, Die Tätigkeitsfelder des höheren Verwaltungsdienstes: Arbeitsansprüche, Ausbildungserfordernisse, Personalbedarf, Opladen: Westdeutscher Verlag, 1973, pp. 489-496.

5.2.3 "Requirements"

Analysis of functional areas of the employing organizations or work tasks do not directly address the problem of relating the functions and tasks to training. Questions regarding "requirements" intend to define "skill requirements", "knowledge required" or "abilities needed" in a way that makes relationships between education and job tasks visible.

In many surveys graduates were given long lists of "requirements" and asked to select those which played a rôle in their job, for example engineers were asked: "Skills and abilities important for the successful completion of work tasks vary from job to job: What is especially important at your works?" The engineers had to check a list of 81 items as to whether they were (1) less important/unimportant, (2) important or (3) very important.

The categories chosen in this survey as well as in almost all other surveys show the theoretical problems of defining "requirements". We can observe different ways of addressing work tasks or education:

- Task-related categories ("taking into consideration the interests of the enterprise"),
- Subject-related categories ("applied mathematics"),
- Categories of abilities not covered by tasks or subjects ("reliable person", "ability for problem-solving").

Unfortunately, most surveys on "Qualifikation" regarding highly qualified manpower define specialized skill requirements on the basis of fields of knowledge which have to be applied to the job. Research describing job tasks on the one hand, and on the other fields of knowledge which have to be utilized, fails to take into account a major segment of "Qualifikation", the ability to link knowledge to work tasks. This was done however in another survey. Sociologists were asked what foci for university examinations they would suggest in the light of their occupational experiences. The replies led to the following rank order:

(1) ability for critical and logical thinking,
(2) ability to apply theoretical knowledge,
(3) problem-solving attitude,
(4) ability to apply methods,
(5) knowledge of theories and terminology.[1]

In most surveys, a "functional" definition of "requirements" prevails. In a survey conducted in the late sixties, managers were asked to assess what kind of "abilities" were needed in their jobs. They gave highest priority to "ability to make decisions and to take responsibility" (88 per cent) and "ability to perceive problems, their relevance, and to be able to inter-relate them", whereas least priority among a list of about 20 items was given to "ability to give lectures" (26 per cent).

---

[1] M.V. Bebenburg and S.Lamnek, Zur Situation Münchner Soziologen in Ausbildung und Beruf, München, 1974; cited in Busch et al., op.cit. p. 126.

Lists of priorities of requirements for highly qualified manpower compiled in this way show general skills, work attitudes and social skills at the top and specialized skills at the bottom. This does not only apply to management positions or to graduates in economics, social science etc., but also to engineers.

It would be misleading, however, to believe that graduates consider the rôle of specialized skills for job performance as negligible. Because the kind of specialized skills vary more than general skills in their utility for different jobs, each item of specialized skills ranks low in an average score of all graduates, but each graduate ranks some specialized skill requirements very highly. Thus, the presentation of the data may be misleading in assessing the rôle of major groups of requirements.

The classification of single items of "requirements" according to broader categories derives in many cases from theoretical concepts of "Qualifikation" (see Figure 2). One researcher employing the inductive approach of a factor analysis in his study on managers found seven groups of requirements:

- Conceptualizing abilities,
- Communications skills,
- Social skills,
- Ability to organize,
- Leadership,
- Ability to co-ordinate,
- Learning to co-ordinate.

Most surveys ask graduates to rate the requirements of their own jobs. A few surveys have been conducted asking heads of personnel offices or persons in supervisory functions. In a survey on recruitment of graduates, 185 enterprises were asked to rate their priorities among recruitment criteria. The findings provided the following rank order:

1. Field of study,
2. Problem-solving ability,
3. Initiative, dynamic behaviour,
4. Ability to carry through,
5. Communication skills,
6. Appearance,
7. Grade point average,
8. Occupational experience,
9. Presenting oneself,
10. Foreign languages,
11. Doctoral degree,
12. Hobbies.

Findings on recruitment criteria, however, deviate to some extent from statements on job requirements, because employers might stress skills neglected in previous training, rare skills or skills especially needed in the early stages of a career.[1]

Research on "Qualifikation" tends to analyse "job requirements" in a somewhat narrow way. First of all, most questions refer to the present job and not to the career. Second, research on "requirements" harbours in most cases a narrow view on occupations. It takes into consideration skills directly related to job performance but hardly to the occupational rôle in general. One study, however conducted on "soziale Handlungskompetenz" refers to additional competences needed to understand and shape one's own occupational destiny. For example, criteria for promotion refer only in part to job tasks and past performance: persons fulfilling present job tasks faithfully, who do not care to get further qualified, and who already perform some tasks closely related to a possible future job, might be disadvantaged in their career.

5.2.4 Relationships between skills acquired in education and job requirements

Most surveys on careers of university graduates address directly the relationships of job requirements on the one hand and the "outcomes" of education in terms of "qualifikation" on the other hand. As already mentioned, specialized job requirements have been frequently surveyed by formulating items according to field of study or themes of courses. For example, business graduates were asked whether their jobs required knowledge of labour law, sociology etc. In some surveys, graduates were asked a more open question: Which fields of knowledge were applied on the job or proved to be useful?

Other surveys addressed deficiencies felt by graduates in performing their job tasks. In one survey these shortcomings were formulated according to types of requirements. For example, persons holding a degree in education mentioned most frequently to be lacking in social skills, didactical abilities and abilities to plan and organize working processes. Specific knowledge was ranked only fourth in the list of nine items. In another survey, graduates in economics and business were asked to name fields of knowledge in which they considered themselves insufficiently trained. The graduates mentioned most frequently law, computer and data processing, management and mathematics/statistics.

---

[1] See Michael Buttgereit, Rolf Holtkamp and Ulrich Teichler, "Zum Bedeutungswandel von Hochschulzertifikaten," in Zeitschrift für Sozialisationsforschung und Erziehungssoziologie. Vol.1, No.2, 1981, pp. 221-240.

In some surveys, graduates were requested to assess the utilization of their college education in detail. Mechanical engineers surveyed in 1973 stated that they acquired 77 per cent of their knowledge in mathematics and science at college and 23 per cent on the job (including further education). The corresponding percentages were 54 : 46 in engineering and 24 : 76 in non-technical fields. The engineering graduates also stated that 34 per cent of their college education had been in mathematics and science. On the basis of their job experience they suggested that this ought to be reduced to 31 per cent. Similarly, they suggested a reduction of engineering courses from 55 per cent, and an increase to 22 per cent of courses in non-technical fields instead of 11 per cent they took during their studies.[1]

The findings of this survey led to continuous debates about the need to improve the training of engineers in non-technical fields. The survey was heavily criticized by many scholars for producing an artificial accuracy by asking engineers to provide exact percentages on the utilization of fields of knowledge, although most persons do not remember exactly how much time has been spent or what kind of training is needed to acquire certain skills and to what extent certain knowledge can be acquired best through college courses, further education or on the job.

Finally, graduates were asked in many surveys to assess broadly the utilization of their knowledge. A survey conducted in 1979 showed that 53 per cent of college-trained manpower considered that they utilized their knowledge well. Almost all others utilized their knowledge to some extent; at most 3 per cent considered their studies useless for their job. This survey showed that the longer a graduate works the more likely he considers his studies useful for his job tasks. Whereas only 41 per cent of recent graduates (up to 4 years after graduation) stated that they utilized their knowledge well, 74 per cent of graduates who had graduated 30 and more years earlier considered their studies useful[2]. These findings hardly can be attributed to a presumed "over-education" in the seventies, because this recent phenomenon of problems to find adequate jobs cannot explain the continuous relationship between age and assumed utilization of knowledge. One might conclude that job satisfaction overshadows the perception of the utilization of knowledge.[1]

---

[1] R.W. Peters and M.Polke, Beruf und Ausbildung der Ingenieure, Düsseldorf: Verein Deutscher Ingenieure, 1973, pp. 58-64.

[2] See Friedemann Stooss, "Ausgewählte Befunde zur Situation der Hochschulabsolventen in der Bundesrepublik Deutschland im Jahre 1979," in Mitteilungen aus der Arbeitsmarkt- und Berufsforschung, Vol. 12, No.4, 1979, p.617.

5.2.5 Substitution

As mentioned before, one major issue in research on higher education and employment in the Federal Republic of Germany is "substitution". This issue is treated in almost all surveys, and many questionnaires took over from previous ones a standard set of questions regarding substitution. There are three underlying reasons for this popularity:

(a) Scholars of the Max-Plank Institute for Educational Research first introducing this issue challenged the approach of the manpower requirement forecasts in which the employment system is active in shaping "requirements" whereas the rôle of education is reactive in providing the skills required. Instead they analysed to what extent, and why, new and unexpected skills carry through in the employment system.

(b) Other scholars challenged the notion prevailing in the Federal Republic of Germany of the extent to which a field of study is linked to certain occupations: Instead of stressing a close linkage, as manpower requirement forecasts tended to do, one ought to take into consideration the flexibility in the relationships between education and employment. Many studies conducted by the Institute of Labour Market and Occupational Research analysed especially horizontal substitution: the extent to which jobs are or can be taken over by graduates from various fields of study or the extent to which graduates can or do take over jobs other than those closely corresponding to their field of study.

(c) Many studies discussed the phenomenon of "upgrading": To what extent do university graduates take over positions previously held by non-graduates? What are the supportive factors and the barriers of that process? To what extent does this process prove to be useful in terms of a better accomplishment of work tasks and to what extent it can be considered superfluous in terms of utilization of knowledge provided by the university? These questions have also been raised by the above mentioned research groups, but played a more important rôle in several recent studies.

---

[1] Whereas the data in the Federal Republic of Germany show that - according to the graduates' statements - utilization of studies at work and job satisfaction is growing during career, a study conducted in the U.S. came to the conclusion that utilization of knowledge acquired at college is diminishing in the career, but job satisfaction increasing; see Nancy L. Ochsner and Lewis C. Solmon: College Education and Employment. Bethlehem, Pa.:CPC Foundation, 1979.

The research team of the Max-Planck Institute had asked graduates of political science:

- What kind of education and training the predecessor in their position had acquired;
- What kind of education and training the most important colleague, the person supervising the political science graduate and the head of the institution had acquired;
- Assuming the graduate changed his position: Who would be, according to his opinion, most appropriate for this position?

The Institute of Labour Market and Occupational Research took over the questions regarding the predecessor and possible successor and employed it in surveys on graduates of many fields of study; In this way they established a matrix of overall substitution taking place between graduates. According to the terminology chosen by the Institute:

- "realized substitution"[1] was measured by comparing the education of persons presently holding a position and that of his predecessor,
- "active realized substitution" by the share of persons holding a present job with a given education whose predecessors had a different educational background;
- "passive realized substitution" by the share of predecessors with a given education whose successors (present holders of positions) have a different educational background.
- "latent substitution" was measured by comparing the education of present job-holders and the education of possible successors according to statements of the present job-holders;
- "active latent substitution" by the share of cases in which persons with a given education were named appropriate successors by present job-holders having a different education;
- "passive latent substitution" by the share of present job-holders suggesting that their successors' educational background ought to be different from their own.

---

[1] The Institute of Labour Market and Occupational Research uses "flexibility" as the overall term and defines "substitution" as initiated by employers and "mobility" as initiated by the labour force; see Institut für Arbeitsmarkt- und Berufsforschung der Bundesanstalt für Arbeit, Berufliche Flexibilität und Arbeitsmarkt, Nürnberg, 1977. This terminology is somewhat confusing because "flexibility" is used both for "movements" which might be necessary, if training was narrow, and for broad skills; also, the measurement of changes of skills between a past and a present job-holder does not permit any explanation about who initiated that change. Finally "mobility" has a broader connotation.

Table 14 summarizes the degree of "latent" and "realized substitution" measured on that basis for various fields of study. In addition, "potential substitution" was defined by the overlap of job tasks, measured by job tasks rating; this method, however, was employed only for those who did not have a university degree.

Some additional studies deal solely with "vertical substitution". For example, the college-trained persons in the 1979 survey were asked to indicate which type of education was best fitted to the requirements of their jobs:

- Seventy-six per cent of university graduates stated that university education in their field of study was most appropriate,
- Ten per cent considered another university major would do equally well,
- Three per cent considered another university major preferable,
- Five per cent considered a vocational college degree sufficient,
- One per cent considered a vocational college degree preferable,
- Three per cent did not see any necessity for college education in the accomplishment of their job tasks[1].

The research findings on the educational background of predecessors indicate to what extent new fields of study carry through on the labour market. They also show that substitution takes place to an extent previously underestimated. They do not give information, however, about the utilization of skills or satisfactory accomplishment of job requirements. There could be other reasons for taking over positions previously held by a person with a different educational background: for example, shortage of persons holding the degree required, poor quality of recruitment practices, difficulties in assessing appropriate relationships between job requirements and skills of the labour force, etc. Therefore, it is not surprising that the Institute of Labour Market and Occupational Research was frequently criticized for over-interpreting the findings.

5.2.6 "Appropriate employment"

One of the major issues of research regarding the careers of graduates was the chance of finding an "appropriate employment" (adäquate Beschäftigung). Given the strong tendency in the Federal Republic of Germany to perceive relationships between education and employment primarily in terms of a match of job requirements and acquisition of skills, it is not surprising to find that "Qualifikation" was considered to be the major dimension of appropriate employment.

---

[1] Stooss, op.cit. p.616.

Table 14. Latent Substitution and Realized Substitution of Highly Qualified Manpower 1970 (Percentage)

University and college degree in:	Latent Substitution				Realized Substitution			
	Passive: could be substituted by persons with:		Active: could substitute for persons with:		Passive: has been substituted by persons with:		Active: has substituted for persons with:	
	Other subjects	No college degree	Other subjects	No college degree	Other subjects	No college degree	Other subjects	No college degree
Economics and social sciences	12	41	60	10	-	-	-	-
Law	42	19	53	-	40	30	17	33
Mathematics	58	23	63	13	20	20	58	4
Physics	58	19	67	12	44	7	33	15
Chemistry	43	10	34	16	6	2	5	2
Biology	38	-	43	6	61	-	46	-
Architecture	15	36	11	42	7	17	9	23
Appl. engineering, mining and metallurgy	38	22	50	23	12	8	24	11
Mechanical engineering	46	31	33	41	16	21	17	20
Electrical engineering	47	32	33	40	25	21	28	17

Source: Institut für Arbeitsmarkt- und Berufsforschung der Bundesanstalt für Arbeit, berufliche Flexibilität und Arbeitsmarkt, op. cit., pp. 14 and 20 (Quintessenzen aus der Arbeitsmarkt- und Berufsforschung, No. 7).

BEST COPY AVAILABLE

Traditionally, occupations typically held by graduates and the typical range of income of those employed in the public sector were taken as indicators of appropriate employment. They were considered as "objective criteria". Research on graduates' careers gave much more attention to utilization of knowledge as criteria for appropriate employment. For this was perceived to offer more dynamic indicators of appropriate employment.

In addition, content, work styles and working conditions typical for graduates were considered indicators of appropriate employment. One survey for example asked engineering graduates what autonomy or leeway they had in:

- choosing a job task,
- taking over single steps of the overall tasks,
- determining the sequence,
- determining the pace,
- handling the tasks over time,
- choosing means and tools,
- choosing the way of handling the means and tools,
- determining the persons with whom they would co-operate,
- determining ways of co-operation,
- controlling the quality of the output.

In this case, the researcher assesses what working conditions and work styles are typical for graduates' jobs. Other surveys took the graduates' expectations regarding content, work styles and working conditions as a yardstick. For example, graduates were asked how important they considered certain aspects of their jobs. In addition, they were requested to state which items of a specified list of job aspects were applicable to their present jobs. The authors classify the items according to

- status-oriented motives (salary, opportunities for promotion, prestige),
- education-oriented motives (application of knowledge acquired at college, opportunity to develop and apply ideas, opportunity to carry through conceptions developed during their studies, opportunities to communicate and co-operate with persons having graduated in the same field of study.

It was considered that the match between education-oriented motives and the characteristics of the jobs in terms of realizing the applications of knowledge and other education-oriented motives as an indicator of the extent to which appropriate employment is available for graduates.

All the approaches of measuring appropriate employment discussed until now consider dimensions of "Qualifikation" decisive or predominant in assessing whether a graduate is appropriately or inappropriately employed. In the late seventies, however, further dimensions were also considered suitable as a yardstick. It was argued that perceptions of an appropriate job also include non-substantive dimensions, for example security of employment, supervisory functions or good income. For example, surveys show that graduates of economics and business who hold high positions frequently consider their employment as appropriate, but do not perceive a close relationship between job requirements and their studies. On the other hand, graduates employed in social work perceive a close substantive link, even if they consider their positions inappropriate.

The authors of a survey on education graduates (Diplom-Pädagogen) recently analysed the issue of appropriate employment in more detail than previous studies. They also defined it on the basis of substantive relationships between education and work as well as leeway for action on the job. They measured it through a combined score of replies to various statements. The questionnaire included a wealth of items regarding potential factors of job satisfaction:

- characteristics of their own work (competitive, undemanding, application of knowledge, innovative, etc.)
- characteristics of colleagues (reliable, co-operative, selfish, active, secretive, etc.),
- characteristics of the organization employing them (bad planning, good possibilities of participation, insufficient flow of information, hierarchical principles prevailing, etc.),
- characteristics of supervisor (polite, trustworthy, low education standard, controls permanently, dislikes education graduates, progressive, etc.),
- opportunities for promotion within the organization (good, only according to seniority, based on achievement, etc.),
- salary (appropriate to position, corresponds to achievement and educational background),
- characteristics of general working conditions (pleasant, insufficient space, tiring, inadequate materials, good equipment, etc.).

The authors show that the notion of an "appropriate job" correlates highly with elements of the organization of work and the present working conditions, i.e., "open" organization, non-bureaucratic organization, limited supervision and high decision-making power. On the other hand, the notion of an "appropriate job" does not seem to be influenced by status categories such as salary. One might add that very few surveys on graduates conducted in the Federal Republic of Germany took job satisfaction into consideration.

5.2.7 Suggestions for study reforms

In some surveys graduates or employers were requested to draw conclusions from their occupational experience about study reforms. In previous sections two approaches of that kind have already been discussed:

- Several studies asked graduates to state deficiencies or shortcomings in their training given their job experience and job tasks. The items provided in questionnaires are frequently formulated according to fields of study or courses, thus indirectly hinting at curriculum reform.

- Engineering graduates were requested to state exactly what percentage of their time students ought to spend in 16 different fields of knowledge.

Further questions put to graduates regarding study reforms refer to the following topics:

(a) Organization and methods - for example:

-"Would you make content and sequence of studies more mandatory, permit the students more freedom of choice, or would you continue the current state of affairs?"

-"Would you suggest more written examinations at the end of term, less examinations, or do you consider current regulations are best?"

-"Would you suggest increasing the number of seminars and other courses including discussions or the number of lectures (Vorlesungen)?"

The questions regarding study reforms reflect the major reform debates at the time a survey was conducted. The questions cited were asked in the late sixties when debate about teaching methods etc. was popular.

(b) Some surveys asked what kind of pre-occupational work experience was desirable. For example, amongst the political science graduates surveyed in 1968, 19 per cent suggested work experience (Praktika) before enrolment, 38 per cent whilst enrolled, 38 per cent a practical training phase after graduation (multiple replies possible). Only 7 per cent considered pre-occupational work experience was unnecessary. These results reflect the widespread interest in work experience as part of formal education and training in the Federal Republic of Germany, and which has become even more popular recently.

(c) New slogans of "Praxisbezug" or "Praxisorientierung des Studiums" (orientation toward practice) were taken up in surveys by asking graduates (or other persons) how to realize the concept of a closer linkage of study and job. As another survey concluded in 1980 shows, direct ways of addressing practical problems in lectures (including case studies and simulation games) and direct experience are considered more important to realize these goals than changes in content in terms of fields of knowledge.

Altogether, it is not surprising to find less surveys including proposals for curriculum reform than, for example, those discussing substitution or appropriate employment, for asking these questions implicitly assures that the graduates or employers are experts on study reform.

5.3 "Qualifikation" of economics and engineering graduates

5.3.1 Aims of this overview

An overview has been given above on the way research on higher education and employment addresses issues of substantive relationships. This was focussed on approaches and methods. Description of findings was very selective and primarily aimed at indicating the merits and weaknesses of various concepts and methods. This section focusses on research findings: What is the state of knowledge regarding the qualitative relationships between higher education and work? It would surpass the possibilities of this study to present and discuss the findings of all research available, for one would have to include several hundreds of publications. Therefore two major fields were selected here: economic and technical fields of study. None of the reports will be comprehensive, but will focus on findings important in complementing "quantitative" approaches and for educational policy and planning. In addition to the major topics of this report some information will be provided on the labour market, the courses of study and the students.

5.3.2 Economics graduates

Teaching of economics at university level was traditionally divided into macro-economics (Volkswirtschaftslehre) and micro-economics (Betriebswirtschaftslehre). In the sixties and seventies, some universities introduced a new type of course leading to a degree of "Diplom-Ökonom". For convenience we shall use the term "economics" for all the above mentioned fields. These courses aimed at improving integration of macro-economics, micro-economics and in some cases social sciences. Both traditional fields provide regular courses leading to a diploma. There is not like in the United States any gap between a prestigious "master of business administration" on the one hand and undergraduate courses in economics on the other hand; length of study is more or less even; macro-economics has the reputation of being somewhat more demanding[1].

Almost 30 per cent of freshmen enrolling in economics choose vocational college education requiring only twelve years of schooling - as opposed to 13 years for university admission -

---

[1] On curricula see the overview provided in J.E. Staufenbiel and G. Koetz, Die wirtschaftswissenschaftlichen Fakultäten, Studiengänge und Berufsfelder für Wirtschaftswissenschaftler und Wirtschaftsingenieure, Köln, 1980.

as prerequisites and leading to an examination after about 3.5 years of study. Most of the courses offered at vocational colleges are in business.

In 1979, 72,000 university students (9 per cent of all university students) and 19,000 vocational college students (10 per cent of all vocational college students) were enrolled in economics. Among highly qualified manpower, almost one-tenth are graduates in economics. One-fifth of the economics students at university and one-fourth at vocational college are female. Less than 15 per cent of employed economics graduates are female. The percentage of women ranks second lowest among major fields, being only higher than in engineering.[1]

Data available on choice of subject, educational and occupational goals as well as expectations regarding working life - no matter whether related to beginner-students,[2] students in the course of study[3], close to graduation or after graduation[4] - show consistent characteristics of economists:

- Their school achievement was less than average among freshmen;[5] a high percentage of their parents did not have college education.

- Many economics freshmen both at university (38 per cent as compared to 31 per cent average) and vocational college (42:31) stated that they had not been sure whether to enroll and had considered alternatives. Less than average (45:59 per cent of university freshmen, 45:67 of vocational college freshmen) stated that their field of study perfectly corresponded to their choice[6]. Thus, it is not surprising to find many economics graduates stating that their occupational choice was random (35 per cent as compared to 26 per cent of all graduates).

---

[1] Bundesminister für Bildung und Wissenschaft, Grund- und Strukturdaten 1981/82, Bonn, 1981, pp. 120-131.

[2] Heinz Stegmann: "Studenten in Anfangssemestern: Einstellungen zum Studium und zum zukünftigen Beruf", in Mitteilungen aus der Arbeitsmarkt- und Berufsforschung, Vol. 13, No.1, 1980 pp. 57-76.

[3] See the overview in Eckart Liebau: Der Habitus von Ökonomen, Kassel: Wissenschaftliches Zentrum für Berufs- und Hochschulforschung 1981, pp. 96-112.

[4] Studenten zwischen Hochschule und Arbeitsmarkt, München: Saur 1980.

[5] Tino Bargel, "Schulleistung und Ausbildungswahl," in Hansgert Peisert, ed., Abiturienten und Ausbildungswahl, Weinheim: Beltz, 1981, p.145.

[6] Stegmann, op.cit., pp. 61-2

- Economics students stress salary and status expectations as well as the possibility of autonomous decision-making. Intrinsic goals and faith in one's own abilities in the choice of the major and the occupation play a much lesser rôle than on average for all students and graduates.

- The instrumental motives are also expressed in the labour market attitudes: economics students state frequently that they keep themselves well informed of the labour market[1]. They are more ready than others to accept other jobs or additional training if they face difficulties in getting the job they had hoped for.

- As regards to utilization of knowledge, the responses of graduates in economics correspond to the average for all fields.

- As regards job satisfaction, as far as is revealed by general statements, replies of economics graduates are close to average. Asked about satisfaction regarding various aspects of their job and asked to describe their job characteristics, economics graduates seem to be more satisfied with their jobs than on average, as Table 15 indicates.

Most labour market data do not provide accurate information on economics graduates, because in most cases data on economics and social science are aggregated. This holds true for most publications on census data as well as for unemployment statistics, thus aggregating low unemployment of economics graduates and high unemployment of political science and sociology graduates.

About 65 per cent of economics graduates are employed in the private sector, 15 per cent are self-employed and 20 per cent are employed in the public sector[2]. The average salary of university graduates of economics and social science was 75,500 DM as compared to 59,000 DM for university graduates of all fields[3]. A higher than average mobility of economics and social science graduates is also indicated, at 20 per cent.

---

[1] Stegmann, op.cit., p. 71

[2] Detlef Krause, Die Beschäftigungs- und Berufssituation von Wirtschaftswissenschaftlern in der Bundesrepublik Deutschland, Bonn/Bremen 1979, mimeo.

[3] The data on university level indicate the situation of economics graduates to some extent, because they comprise 84 per cent of the respondents in that field. The data on vocational school graduates are misleading because they include a large share of social workers.

Table 15. Job characteristics rated by graduates of engineering, economics/social science for all universities and colleges, vocational colleges, and by total labour force (percent stating "prevailing").

Job characteristics	Engineering graduates	Economics/ social science graduates	All university and college graduates	All vocational colleges graduates	Total labour force
My job is well paid	38	50	43	38	37
My job entails minimum red-tape work	13	17	21	13	33
My job leaves much time for my family	11	16	18	18	27
There are possibilities for autonomous actions	62	71	67	67	55
My job leaves plenty of time for hobbies	10	15	14	14	21
My job is fully occupying	86	80	84	80	70
Common sense has to be applied in my job	87	86	87	88	73
My job provides the opportunity to satisfy my desire for new knowledge	29	26	29	23	11
Theoretical problem-solving is needed in my job	44	42	39	44	21
My job offers opportunities for promotion	36	35	27	33	25
My job is highly regarded in society	42	46	38	33	28
My job permits to carry through ideas	59	52	48	49	32
My job offers the opportunity to help others	39	53	59	37	45
My job involves frequent travel	31	31	23	37	23
My job permits arrangements with colleagues on how to divide job tasks	42	39	41	53	37
My job requires an autonomous application of skills and abilities	74	74	76	77	62
My job permits choosing one's own pace	44	54	41	47	44
There isn't any permanent supervision in my job	51	54	50	54	47
My job provides much variation	66	65	60	65	52
In my job one frequently has to work under time pressure	66	64	57	67	49
On my job one has to work under pressure to avoid wastage	49	32	26	46	20
My job is enjoyable	71	67	71	66	57

Source: Akademiker in Deutschland, Hamburg: Spiegel-Verlag, 1980, pp.32, 137-140.

BEST COPY AVAILABLE

Manpower requirement forecasts regarding graduates of economics were less frequently conducted than in the case of those in engineering and teacher training. The most frequently mentioned study, sponsored and published by the Federal Ministry of Education and Science, provided the following estimates of demand for 1990:

- minimum demand: 169,700,
- intermediate demand: 191,000
- maximum demand: 213,700;

The supply estimates were:

- minimum supply: 181,100
- intermediate supply: 273,200
- maximum supply: 276,400.

Although the data permit the conclusion that the supply might cover between 80 and 163 per cent of the demand and that a broad guess might consider a 20 per cent oversupply likely, the authors argued that under- and oversupply of about 10-15 per cent was equally likely[1].

Surveys of job requirements stress that specific skills play a lesser rôle than in many other areas of employment. Rather, a combination of general cognitive skills, specialized knowledge, as well as certain attitudes and communication styles, play an important rôle. According to a study summarizing various surveys available, general skills such as abilities to conceptualize, to learn, and to lead had more importance than special skills. The underlying change of job requirements becomes all the more important if one takes into account that these requirements traditionally play a rôle in high positions, but more graduates have been taking over intermediate positions in recent years.

Job requirements seem to differ to some extent according to the functions within enterprises. As some surveys show, specific knowledge is more highly regarded for accounting and administration than in other divisions, whereas general abilities and personality are considered more important in sales and management. The differences are, however, by no means drastic.

One survey shows, however, that more than 70 per cent of graduates specializing in banking, trade or taxes were employed in corresponding institutions. The emphasis put during one's studies might give an edge in getting certain jobs, but jobs do not seem to require a substantial degree of specialization during one's course of study.

---

[1] Hans Ludwig Freytag et al., Hochschulabsolventen im Beruf: Beschäftigungslage und Berufschancen für Wirtschaftswissenschaftler, Juristen, Sozialwissenschaftler 1961 bis 1990, Bonn: Bundesminister für Bildung und Wissenschaft, 1975, (the data cited are from Tables 133-135).

BEST COPY AVAILABLE

The limited weight placed on specific skills seems to be widely accepted. Twenty-five per cent of section heads and only 12 per cent of university graduates surveyed suggested that curricula be geared closely to certain functions in industry and commerce, as Table 16 shows. It is interesting to note, though, the difference between university graduates on the one hand and vocational college graduates (47 per cent) on the other hand. Although vocational college graduates are assumed to be prepared more directly for immediate job tasks, they might over-rate the rôle of specific training thus hoping to counterbalance disadvantages in their competition with university graduates. This seems not to be justified, because in the survey conducted by employers' associations, the section heads were not even asked to take into account difference in job requirements for university and vocational colleges.

Regarding the specific knowledge required for positions held by economics graduates, employers and graduates do not differ widely as far as the rank order is concerned. In a survey conducted in 1980, from a list of 18 fields of knowledge, section heads (graduates) considered the following aspects as most important:

- General knowledge of micro-economics: 49 (48) per cent;
- accounting: 24 (43) per cent;
- administration/computer and data processing 19 (29) per cent;
- tax law 15 (20) per cent;
- finance/investment 12 (12) per cent;
- personnel management/labour law: 10 (18) per cent.

Table 16. Courses of study recommended for economics graduates by section heads and graduates (Percentage)

	Section heads (recruitment criteria)	University graduates	Vocational college graduates
Curricula geared to certain functional areas of employment	25	12	47
Broad and interdisciplinary study	42	57	19
Both ways equally valuable	32	27	33
No response	1	4	1
Total	100	100	100

Source: Claus Kemmet, Hermann Linke and Reinhard Wolf, Studium und Berufschancen. Herford: Maximilian-Verlag 1982, pp. 98 and 101.

In general, however, economics graduates stress more requirements as well as deficiencies of specific knowledge than employers. The deficiencies mentioned differ to some extent from survey to survey: law, personnel management and computer science seem to be fields of knowledge almost regularly mentioned in this respect.

It is difficult to assess to what extent judgement regarding the needs for specific skills is based on job analysis or influenced by notions of deficiencies. Three-quarters of the employers complain that university studies are not sufficiently oriented toward practice. They also claim that grade points in final examinations play a very limited rôle among recruitment criteria. The reasons for these statements might either be the fact that specific economic knowledge is taken for granted and additional requirements are set or that much specific knowledge is superfluous. An assessment of this kind cannot just be based on a more thoughtful data analysis of the survey conducted, because the interpretations of the surveys show that both researchers and respondents do not take this difference sufficiently into account. Probably the methods of asking for overall assessment are insufficient to clarify this problem.

As has been mentioned before, the classification of general skills, social skills,personality, norms etc. is debatable. Surveys providing open lists of items frequently stress ability of communication, appearance, "mobility", leadership and similar requirements. One recent survey showed that section heads and graduates assess the kind of requirements very similarly; graduates, however, rate some social skills lower than do section heads. Both stress general cognitive requirements somewhat more strongly than social skills and motivations. Among items in general cognitive requirements, only one was given low ranking: "ability to think creatively." Among items of social skills, one was also rated exceptionally low: 'Ability to perceive social problems in the enterprise and to suggest solutions."

Altogether, expectations of finding loyal and adaptable employees in terms of norms and social skills, as well as pragmatic persons in terms of problem-solving approaches, seem to be very strong. Therefore it was not surprising to find that a survey on employers' preferences regarding universities seemed to be shaped primarily by political notions.

As already discussed, the occupational fields in which economics graduates are working seem to be quite open to substitution. Economics graduates take over positions previously held by graduates of the same subject more frequently than graduates of newly established fields or fields without any fixed area of occupation, for example political science.

But such a succession of skills is less frequent than in almost all major established fields. In particular, economics graduates both of university and vocational colleges take over positions previously held by non-graduates more frequently than graduates of almost all other fields.

Economics graduates frequently state that their positions could be taken over by persons not having a degree in economics. The percentage of persons considering their field of study the most suitable training for their job was

- 92 per cent in law,
- 90 per cent in medicine/pharmacy,
- 77 per cent in teacher training,
- 72 per cent in science,
- 71 per cent in humanities,
- 66 per cent in engineering,
- 63 per cent in economics and social sciences.

Economics graduates face high risks of being substituted easily and have the opportunity to substitute for others easily. Factors of labour market conditions and job requirements are deeply interwoven as factors promoting a high substitution.

5.3.3 Engineering graduates

In the Federal Republic of Germany, engineering fields of study usually consist of architecture, construction engineering, mechanical engineering, electrical engineering etc. In 1980, 95,000 students (11 per cent of all students) were enrolled in engineering fields of study at university level and 92,000 at vocational college level (45 per cent of all students.) About 40 per cent of engineering freshmen are enrolled at vocational college level. The percentage of female students is less than 10 per cent, and in the core fields of construction, mechanical and electrical engineering, there are less than 5 per cent[1].

Data available on choice of major, educational and occupational goals show first of all that engineering students are very determined in their choice. According to a survey, they state more frequently than average students that they had made their mind up early to enroll, that their field of study is the one they intended to enroll in,and that they do not want to change the field of study.

A survey conducted in 1978 shows that engineering students frequently state interest in the fields of study, as well as a corresponding talent, as being the main reasons for choice of a job. They also state far more frequently than average that high salary was an important factor in their choice of major. A survey on graduates asking about reasons for occupational choice provided the same pattern. Graduates of engineering stated far less frequently than average that leisure reasons determined their choice. Thus, intrinsic and status-oriented goals - being split by humanities students on the one hand and economics students on the other - are combined in the case of engineering graduates.

---

[1] Bundesminister für Bildung und Wissenschaft, Grund- und Strukturdaten 1981-82, op.cit., pp. 112-7.

In evaluating their jobs, engineering graduates are somewhat less satisfied than the average graduate. They are less satisfied than average regarding status dimensions (salary, job security and recognition by superiors), but more satisfied in terms of applying their knowledge and talent. They state less frequently than average that their income corresponds to their achievement. The statements regarding job characteristics (see Table 16) also indicate satisfaction in carrying through of ideas and the dissatisfaction with salary; surprisingly, though, they assess positively the possibilities for promotion. It is not surprising to find that work which gives opportunities to help others is stated very seldom. Engineering graduates mention very seldom time available for family or minimum red-tape work. Finally, it is observed that engineers complain about time pressure and pressure to economize.

This evaluation of their jobs corresponds, first of all, to the fact that engineers in the Federal Republic of Germany can expect a higher income than economics graduates in the first stages of their career, but this pattern reverses at later stages. Second, many engineering graduates perceive a conflict at their work between finding new or better technological solutions on the one hand and the economic aims of the enterprise on the other.

The total number of engineering graduates employed in 1979 was 122,000 holding a university degree and 396,000 holding a vocational college degree. Whereas the ratio of educational levels is 1:0.5 in the case of economics it is 1:3.2 in the case of engineering. The percentage of engineers among all graduates employed was 10 per cent at university level and about 60 per cent at vocational college level.[1]

In 1979, 57 per cent of engineering graduates (university degree) were employed in the private sector, 28 per cent in the public sectors, and 11 per cent were self-employed. The corresponding figures for vocational college graduates were 45, 37, and 16 per cent.[2] Engineering graduates holding a university degree were employed more frequently in larger enterprises. As regards salary, engineers holding a university degree earned 70,300 DM in 1979, 19 per cent more than average of all university and vocational college graduates. Engineers graduated from university earned 26 per cent more than engineers of vocational college level (55,800 DM).[1]

---

[1] See the data summarized in Akademiker in Deutschland, op.cit., pp. 391, 409, 412, 427-430

[2] Ibid., p.391.

Regarding the employment of engineers, one of the major topics focussed on the comparison of income and status of university-level engineers on the one hand and vocational college graduates on the other. All data available suggested the considerable advantage of university-level graduates in terms of percentage of promotion to top positions in enterprises and salary. There was, however, an overlap of careers and a lower income gap indicating a better chance for engineering graduates of vocational college level to catch up with university graduates than typical employment patterns in the public sector would permit.

For many years employers' and professional associations played down the differences in career opportunities, claiming more or less even status prospects. In many cases, intentional misinformation could be observed: for example figures were provided about absolute numbers of engineers of both levels holding top positions, thereby neglecting the unequal possibilities for promotion to such positions given the fact that there are three times as many vocational college graduates than university graduates among engineers. Recently, however, even a publication by the Institute of German Economy (Institut der deutschen Wirtschaft) provided data available about the existing salary gap. Among the various data provided, it was shown that university graduates have a better chance to take over top poisitions. Contrary to many statements, the survey indicates a widening of this gap in the seventies, as Table 17 shows.

Another recently published overview comparing job opportunities for university and vocational college graduates cited a report according to which engineers holding a doctoral degree supervised 21 persons, engineers graduated from university 12 persons, and those from vocational college 4 persons.[2]

---

[1] Ibid., p.392.

[2] "Prestigefrage?", in UNI Berufswahlmagazin,No.5, 1982 pp. 21- 22.

Table 17. Educational background of managers and top level employees in private enterprises 1972 and 1981 (Percentage)

Position	University graduates	Vocational college graduates	Non-graduates	Total
Managers 1972	40	18	42	100
Managers 1981	48	19	33	100
1st and 2nd rank employees 1972	18	23	59	100
1st and 2nd rank employees 1981	26	25	49	100
1st rank employees 1981	33	24	43	100
2nd rank employees 1981	18	27	55	100

Source: Adapted from Heinz Evers and Georg von Landsberg, Qualifikation und Karriere, Köln: Deutscher Instituts-Verlag 1982, pp. 26-8; based on data provided by Kienbaum Vergütungsberatung.

Requirements forecasts on engineers played an important rôle in the public debate. In the late sixties a shortage of graduates was expected and in the mid-seventies most forecasts foresaw an oversupply. A substantial shortage of graduates was again predicted in the late-seventies. According to a survey conducted in the mid-seventies,

- 44 per cent of scientists and engineers employed in industry and trade were assigned to positions in research and development (53 per cent of university graduates, 38 per cent of vocational college graduates),
- 32 (26/36) per cent in production,
- 14 (14/15) per cent in administration,
- 7 (5/8) per cent in sales and
- 3 (2/3) per cent in purchasing.[1]

This does not mean, however, that most engineers are directly taking over production, sales and purchasing activities to such an extent. According to another estimate, about 20 per cent of engineers are directly assigned to divisions of production and trade. All available surveys come to the conclusion that engineering university graduates take over positions further removed from the production process than do vocational college graduates.

---

[1] Batelle-Institut, Bedarf und Angebot an Ingenieuren, Bonn: Bundesminister für Bildung und Wissenschaft, 1975, p.145.

Efforts to analyse the job lead to different classifications. Major criteria of classification are:

- Division of enterprise, functional area etc.,
- object of activities (construction, machine tools, etc.),
- kind of activity.

When asked to describe their job tasks, engineers stated most frequently "directing and supervising production", "development" and "testing, examining" (see Figure 3). Among further statements, following in rank order, both "technical" as well as administrative/trade tasks play a considerable rôle.

As already mentioned, most surveys analysing specific skills needed choose categories close to fields of knowledge. In one survey, mechanical engineers were asked to rate the importance of skills according to broader criteria. Their replies provided the following rank order:

1. Construction,
2. Basic engineering knowledge,
3. Mathematics and science,
4. Non-technical fields,
5. Production technology,
6. Machine technology.

One study showed that engineers stated the necessity to increase "analyses and optimization of systems" and non-technical fields on the one hand and gave lesser weight to knowledge of mechanics and machine tools. This seems to be consistent with major trends of job requirements of engineers: A growing importance of abstraction instead of "hardware"-oriented work, increased thinking in systems rather than conducting experiments, and work tasks which require knowledge of technology, organization, and social and human dimensions.

As regards general knowledge and abilities, engineers put emphasis on both abilities of reasoning and problem-solving as well as social skills. According to one survey, "problem-solving solving ability" and "critical thinking" were rated highest, closely followed by "ability to learn", "ability to co-operate", "creativity" and "ability to communicate".

Another survey on construction engineers shows in addition that equal emphasis is put on the following norms:

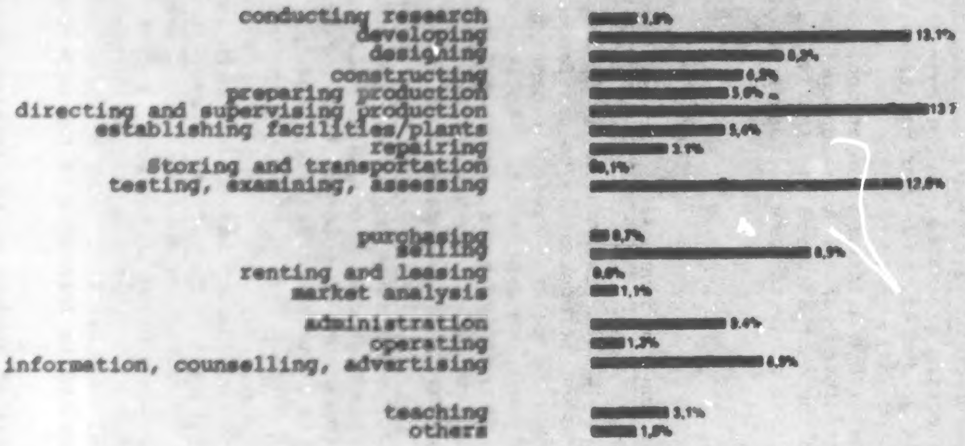
- readiness to identify oneself with projects, working group and enterprise,
- readiness to apply effort, even in the case of boring work,
- readiness to work hard and to do overtime according to the needs of a given project.[1]

Persons in lower positions rate these norms as more important than specific knowledge. Undoubtedly, specific knowledge plays a much more important rôle for engineers than for economists, although engineers state as strongly as economists do,

---

[1] Hanns-Peter Ekardt and Wolfgang Mühlschwein, Der Bauingenieur im Konstruktionsbüro, Darmstadt: Technische Hochschule, 1979, p.90.

Figure 3. Job tasks as stated by mechanical engineers
(percentage of respondents)



Source : Holger Hillmar et al., Studium, Beruf und Qualifikation der Ingenieure, Düsseldorf, VDI-Verlag, 1977.

BEST COPY AVAILABLE

the need to take into consideration general skills, social and normative dimensions. They obviously consider these dimensions to be neglected in curricula[1].

Research on "Qualifikation" has played a practical rôle in making all concerned with engineering education more aware of the rôle of other skills and abilities than those traditionally considered to be the domain of the engineer, thereby challenging the notion of a narrow specialist whose activity relies on his specific skills. This change of view was reinforced by research on substitution processes. As shown in Table 14, engineering graduates, more frequently than on average for all graduates, take over positions held by persons otherwise trained; also their positions are frequently taken over by persons with a different educational background. Asked whether their training was the most appropriate for their position, only 66 per cent answered affirmatively. This was less than for all other subjects except economics and social sciences.

5.4 Conclusion

5.4.1 Implications for requirement forecasting

The strongst impact that research on "Qualifikation" had on manpower requirement forecasts was to reinforce the criticisms against such forecasts. Fewer forecasts have been commissioned since the mid-seventies. Politicians cited forecasts less frequently in justifying their goals, or were more likely to state underlying assumptions.

A second impact closely related to the first was to increase awareness of policy options: in which way regulations concerning recruitment in the public service affected the "demand" for certain groups of graduates; how public opinion could have an impact on job opportunities for graduates of certain fields or certain universities; how the job prospects of graduates in certain fields could be improved by changing curricula, etc.

The third implication was to strive to incorporate qualitative findings in manpower requirement forecasts, for example possibilities of substitution, assessment of the shortages and over-supplies in the past, impact of changing job tasks in certain occupational fields on the ratio of highly qualified manpower etc. Some of those methods have already been applied in forecasts of the mid-seventies.

---

[1] For a more detailed account on the relationships between job requirements and curricula see Wolfgang Neef, "Ingenieurwissenschaften", in Holtkamp and Teichler, eds. op.cit

5.4.2 Policy implications

The criticism of manpower requirement forecasts indicated a broad variety of policy options: for example changing recruitment criteria, redesigning the division of labour, employment programme, changing the structure of the higher education system, changing curricula. Among these, research on "Qualifikation" is likely to provide an information basis primarily on potential change of curricula on the one hand and on the design of job tasks on the other. Given the prevailing notion that education has to play primarily a reactive rôle - to provide skills needed in the employment system -, it is not surprising to find an impact of this kind of research primarily on the debate on curriculum reform in higher education.

Curriculum reform has been a major topic of higher education policy, and research on "Qualifikation" received considerable interest from those involved in curriculum reform and played an important rôle in the debate on such reform. For example, it made known the graduates' strong desire to learn at university how to relate "theoretical knowledge" to the kind of problem-solving required on the job. In many cases, new types of knowledge required became visible. The debate about the need for non-technical courses in engineering was probably the most prominent among those provoked or strongly reinforced by the research.

This does not mean, however, that curriculum reforms in higher education in the Federal Republic of Germany are strongly influenced by research findings on "Qualifikation". For example, efforts to increase non-technical courses in engineering are decreasing; frequently it is argued that any reduction of technical courses would lead to a dramatic decline in the quality of engineering education; there are complaints that non-technical courses are not sufficiently related to the needs of engineers; there is also considerable resistance among those involved to taking into consideration those elements of job requirements which challenge the traditional professional notion of engineers as dealing almost exclusively with technological matters. Also, many university representatives reject the idea of being involved in shaping social skills, although they admit the importance of these dimensions on the job. Further, although research on "Qualifikation" provides insight on the variety of job requirements and tends to support the view that a variety of programmes within a certain field of study might be desirable, the presently prevailing mood favours homogeneity and puts much pressure on universities offering unique programmes. There are obviously many causes which lead to neglect of the advice research on "Qualifikation" might provide.

5.4.3 Limitations of the research on "Qualifikation"

Research on "Qualifikation" of highly qualified manpower is at a stage of development which makes considerable improvement desirable. Some points of criticism as well as some recommendations for improvement should be mentioned here:

(a) Most of the surveys conducted took over the kind of concepts and methods found in other surveys rather than contributing to more sophisticated concepts of analysing the relationships between job tasks, requirements, abilities, learning and knowledge. Thus traditional weaknesses in describing tasks in terms of functional areas, specific requirements in terms of courses or fields of study, abilities in terms of the task rather than of a personality-related or learning-related understanding are perpetuated.

(b) Most surveys take graduates and employers as the experts of "Qualifikation", asking them directly to assess the kind of education needed in order to fulfil job tasks. In contrast to the kind of work that expert committees do in curriculum development,this kind of research can only claim to provide representative findings of experts' views. This is in part due to lack of resources to conduct job analysis, but it would be possible to develop types of questions which go beyond the respondents' overt opinions of requirements and desired curriculum innovation.

(c) Most surveys are quite limited in their educational scope. On the one hand many surveys only ask graduates or employers whether they agree to certain proposals for study reform fashionable at that time. On the other hand they take too many prevailing conditions of higher education for granted: for example, most surveys provide data on the average profile of job requirements that graduates of a certain field of study face, thereby possibly suggesting curriculum innovation in that field of study. This fits with notions of homogeneity of institutions of higher education in the Federal Republic of Germany, but research might also be able to show various types of requirements and thus discuss the alternative of providing different kinds of programme by individual universities.

(d) Most research still focusses on the traditional career of a graduate. The rising percentage of graduates facing difficulties in getting jobs or in being employed in corresponding jobs makes a different kind of survey necessary, and sometimes a completely different kind of communication initiated by the researcher.

(e) Research on "Qualifikation" is still weak in addressing the change in job requirements at various stages of career and their implications for pre-occupational training.

However, one has to bear in mind that a considerable share of the research on "Qualifikation" of highly qualified manpower in the Federal Republic of Germany has been conducted by persons who had not been trained for that kind of research. Sometimes they were just experts of a field of study or an occupational area, sometimes they were trained in social research but not on issues of "qualifikation" If the institutional basis for that kind of research improved and if it was sponsored to the extent manpower requirement forecasts were sponsored in the early and mid-seventies, a considerable improvement could be expected.

6. CHANGING RELATIONSHIPS BETWEEN HIGHER EDUCATION AND EMPLOYMENT: THE IMPACT OF INCREASED NUMBERS OF STUDENTS

6.1 Possible directions for development

The expansion of higher education in the Federal Republic of Germany has caused a supply of graduates on the labour market which, since about the mid-seventies, exceeds the requirements, according to traditional views as regards the needs of the employment system.

Changes in response to the increased supply of graduates can be expected in many ways. The increase in the number of graduates could:

(a) Have a feedback to the number of students, for example by lowering the expectations of secondary students or by spurring actions to restrict admissions,

(b) engender changes in higher education and its outcomes, for example changes in the quantitative distribution of different types of institutions and study courses, of the curricula etc.,

(c) have an effect on the relationship between higher education and employment itself and thus the labour market prospects of graduates, for example in modifying the value of credentials,

(d) lead to a change in the organization of work and the job-rôles.

A first glance at higher education and employment in the Federal Republic of Germany shows that there is not any dominant trend towards just one of the above outlined directions. Also, there are quite divergent views as to the desirability of the possible consequences of the different directions of adaptation to a higher number of students and college-trained manpower.

6.2 The impact on the number of students

The quantitative planning of higher education in the seventies followed a compromise between social demand for higher education on the one hand and concern about oversupply of graduates and high expenditures of higher education on the other.

The percentage of youth concluding any type of college-preparatory secondary education continued to grow in the seventies. It increased from 19 per cent in 1973 to 25 per cent in 1977, but the percentage of beginner-students of the corresponding age group remained more or less constant at about 18 to 19 per cent during this period. Regular surveys on further education plans of college-preparatory secondary school students (Gymnasium and Fachoberschule) during their final year indicate a decrease in the intentions to enroll at institutions of higher education (see Table 18). Although follow-up surveys show that many secondary school leavers later change their minds, the rate of transfer seems to diminish.

There was a debate as to whether, and to what extent, the financial burden of the students and their families had increased. At least for a few years scholarships did not increase proportionately to the rising living costs of students; also it became more difficult for students to find side-jobs. These financial problems might have discouraged some prospective students, but in general the view is shared among experts that this can explain at best only a small part of the levelling-off trend in enrolment. Restricted admission to some fields probably did not contribute directly to the levelling-off in college enrolment. On the contrary, the increasing appearance of numerus clausus seems to have had an advertising effect for these fields of studies around 1970, for the number of students applying to these fields grew over-proportionately, and especially secondary school students with high grade point average changed their minds in favour of restricted subjects.

Certainly the labour market prospects have had an effect on the educational aspirations of youth. It is questionable, however, to what extent this was the result of a market process itself. On the one hand, proponents of traditional manpower notions frequently argued that the campaigns of reformers in the sixties for equality of opportunity and educational expansion had artificially inflated the aspirations and therefore had to be responded to by more realistic information. On the other hand, critics of such a view sometimes argued that there was heavy campaigning on the part of many employers and politicians in the early seventies and that these sinister predictions might have deterred many young people from enrolling at institutions of higher education.

BEST COPY AVAILABLE

Table 18. Further educational plans of college-prep secondary leavers 1971-1982 (in percentage)

Year of secondary school completion	Intend to enroll at institutions of higher education	Undecided	Do not intend to enroll at institutions of higher education	Total
1971	87.2	7.2	5.6	100.0
1972	89.7	6.2	4.1	100.0
1973	88.4	7.0	4.6	100.0
1974	84.6	9.3	6.0	99.9
1975	78.8	12.4	8.8	100.0
1976	75.3	15.4	9.3	100.0
1977	72.7	16.9	10.4	100.0
1978	69.3	18.4	12.3	100.0
1979	67.4	21.6	11.0	100.0
1980	68.3	21.3	10.4	100.0
1981	68.7	21.3	10.0	100.0
1982	67.1	21.9	11.0	100.0

Source: Wissenschaftsrat, Zur Lage der Hochschulen Anfang der 80er Jahre, Köln 1983, mimeogr.

According to some views, the arguments about the oversupply have proved to be a "self-destroying" prophecy. The teachers union, Gewerkschaft Erziehung und Wissenschaft, sees a shortage of teachers in some fields to be likely in the near future. This might be true for some areas, but altogether it must be said that the ratio of college-going youth did not drop and that the output of the colleges will lead to an increase in the number of college-trained manpower, which is very likely to be accompanied by substantial changes in the relationship between higher education and employment. However, there seems to be one far-reaching effect of this alarm about expansion in higher education, which will be discussed in the next section; the arguments about the poor job prospects seem to have a serious effect of demotivation on those youth who do enroll at institutions of higher education.

6.3 The impact on the system of higher education

In the seventies, many proposals were made in the Federal Republic of Germany to reform the institutional patterns of the higher education system, types of courses, the system of examination and graduation and, last but not least, curricula. There can be observed three major directions of reform goals and proposals:

1. The reformist direction favours institutional patterns and curriculum reform, which minimizes a hierarchy of quality and job prospects. The aim is to educate individuals who are able to contribute actively to reform of the occupation system and the society. The traditional aims of the universities to relate teaching and research, as well as to develop individuals through research orientation are positively referred to in the proposal to motivate "inquiring learning" (forschendes Lernen) as the basic principle. As opposed to the traditional principles, this reformist direction proposes an integration of research orientation and an orientation towards work experience (Praxisbezug des Studiums), which fosters early anticipation of the actual tasks graduates will face in the employment system and in the society in general. An institutional integration towards comprehensive universities was frequently suggested, whereby the study programmes ought also to be integrated.

2. A second direction emphasized mainly the preservation of a strong research-oriented sector of higher education as well as the establishment of a diversified system of higher education. According to this view, there is a danger of watering down the quality of research, as well as the education of talented students, if one tries to guarantee more or less equal standards for the total system. At the same time, it is

argued that higher education has to take into account the more diverse future occupational rôles of 20 per cent of the age-group being enrolled now as compared to about 5 per cent for whom the traditional pattern was appropriate. This view favours a disciplinary orientation for the typical courses at universities. Sometimes, proposals have been made to establish a multi-stage system of courses, similar to that of the United States. Proponents of this second direction used to be in favour of the introduction of short-cycle courses at universities, in addition to research-oriented long cycles, and vocational higher education at Fachhochschulen.

3. The third direction favours a strong orientation of higher education towards the assumed prevalent requirements of the occupation system. According to this view, university education should be concerned about the quality of research, but at the same time prepare the students more directly for leading positions in government, business and professions. Proponents of this direction favour on the one hand a clear-cut division of higher education between university-level education for research and for leading positions requiring high intellectual competences, and, on the other hand, higher vocational training strongly related to occupational practice, especially in intermediate ranks but to some extent in higher ranks also. This direction had its institutional basis in particular amongst employers' associations, and some professional organizations, especially among engineers and businessmen; in addition, it has been supported by a large fraction of Rectors of the Fachhochschulen.

The reactions of the system of higher education to the changing labour market conditions for graduates are manifold. The views vary about how far-reaching the educational reforms are and to what extent they can be considered suitable to reduce discrepancies between the outcomes of higher education and the prevailing notions on requirements of the employment system. In any case, it is obvious that the changes in higher education in response to the labour market do not create smooth relationships between higher education and the employment system. Some areas of higher education have reacted only marginally to the labour market, some educational reforms were made to trigger off substantial changes in the employment system, and some rely on corresponding reforms in the labour market or in the organization of work.

6.4 The impact of the relationships between higher education and employment

One of the most dramatic effects of the large supply of college graduates in the mid-seventies, accompanied by a general uncertainty as regards economic development, was no doubt the rapid spread of a very negative mood to the consequences of higher education expansion and a surprisingly irrational debate on the changing relationships between education and employment. This debate in the Federal Republic of Germany cannot just be dismissed as a short emotional interlude in the process of adjustment to social change, and it certainly revealed some widespread attitudes of the public about education.

Three catchphrases have turned out to be very popular: "inadequate employment" (inadäquater Einsatz) of graduates, "coupling or de-coupling" (Koppelung/Entkoppelung) of education and the employment system, and "competition for displacement" (Verdrängungswettbewerb) on the part of the college-trained manpower and other persons.

The expression "inadequate employment" is based first on the assumption that there are clear-cut, permanent notions about the appropriateness of the relation between education and employment. Second, it is argued that more or less all graduates in the past held "adequate" positions. Third, it assumes that the graduates in general want to find a privileged position. Fourth, it takes for granted the traditional strong impact of education on the jobs held and on the status generally conceived to be desirable, although the same persons frequently take an opposite view in using other phrases mentioned above. Fifth, it is based on a model according to which the traditional positions will remain unchanged in case of a high supply of graduates and the "superfluous" graduates must be placed somewhere else. Sixth, it supposes a co-variation of the different indicators of "adequate" occupations such as income, security, prestige, power, interesting work, decision-making power in regard to organization of one's own work, other persons and materials, career opportunities, etc. The argument also has been frequently addressed to youth contesting that they would harm themselves if they should enroll in institutions of higher education.

The argument is based obviously on an exaggerated contrast between the traditional and the possible new positions of graduates, but it does not take into account the dynamics in the development of jobs, and it dismisses the fact that there are many jobs now which are quite demanding in terms of reasonable utilization of competences acquired at colleges although they might not offer the expected status.

The phrases "coupling" and "de-coupling" became popular during the mid-seventies in the political debates on trends and policies regarding the relationship between the education and employment system in general. "Coupling" refers to a state in which education will be geared completely to the qualification requirements of the employment system and the socio-economic status will be determined by educational achievement.

BEST COPY AVAILABLE

The debate on "coupling" and "de-coupling" made clear the difficulties in understanding the existing correlation between education and occupation being turned into an extreme alternative by those phrases of either a complete determination or a complete independence. The inconsistent demand to "couple" education and employment in terms of content and to "de-couple" in terms of status distribution indicates a widespread disapproval of the educational policy in favour of equality of opportunity. Education beyond economic needs was considered undesirable, and rewards for educational accomplishments seemed, according to these views, unnecessary. This debate underlines that the strong reliance of the public sector on educational credentials is often conceived to overshadow completely the development of higher education and the labour market of graduates.

The phrase "competition for displacement" gained popularity among otherwise very different groups hardly sharing any common outlook on matters of education and employment. According to this expression, those graduates not finding an appropriate occupation would finally climb down one step on the ladder of occupations and thus would force another person having been trained for this position to climb down the ladder too. In this way they claimed that persons not having graduated from colleges would be deprived of the chance to take over those positions they would have got in the event of a balanced labour market for college graduates.

It can be shown easily that the phrase is misleading, insofar as realities are concerned. For if the occupation structure remained constant as well as the correlation between educational level and occupational rank, a college graduate taking over a position held otherwise by a non-graduate would in all likelihood have obtained more or less the same position had the expansion of education not taken place. The major difference would be found in terms of a higher educational level, an "up-grading", but probably not in terms of worse job prospects. Thus, displacement as a consequence of educational expansion would only take place within one generation if the weight of credentials grew in general, and this could not be attributed to rationales of the employment system but was forced by the growing supply of graduates. A "displacement" process could be assumed between the generations, for the younger generation had a better chance to enroll at institutions of higher education. It can be noticed, however, that the higher the educational level, the more career patterns dominate, protecting the older working population from being replaced by younger people. Other criteria for occupational success, such as physical strength in the case of manual labour, are much more liable to cause problems for the older generation.

The use of these phrases tended to take for granted certain attitudes about a desirable relationship between higher education and employment instead of provoking a debate on what principles are desirable in this relationship. Thus, they contributed to the difficulties that the politicians, representatives of the employment system and the system of higher education faced in reconsidering the relationship between higher education and employment and eventually reshaping it.

Adaptation processes on the labour market for highly qualified manpower depended partly on the change of attitudes among graduates. The private employers, for example, seem to have changed their minds in the late seventies as regards the growing supply. They considered a higher intake of graduates feasible, provided the graduates developed more moderate expectations.

The results of one survey support to some extent each of the three most widespread views on the attitudes of the majority of students towards the labour market. According to the first view, most students harbour concepts of appropriate occupations following the traditional patterns of academic occupations. Findings about the diminishing interest of students in the study programmes of the colleges might suport this view, too. The second position suggests that students adapt their expectations to the changing market conditions. Among others, a large number of graduates who are not unemployed but do not find appropriate positions, reinforce this view. According to a third argument, students wish primarily to have interesting and intellectually challenging jobs, but accept also a certain loss of income and status. On the basis of not only this survey but also further available information, it is not possible to consider one of these views to be more plausible than the others.

Modifications in the relationship between higher education and employment in response to the large supply of graduates have to be sought primarily in the employment system. Three major types of changes could be expected, if we exclude for the moment changes in the organization of work and the work tasks:

(a) a reduced weight of credentials in determining the career in general,

(b) processes of vertical substitution, whereby the additional graduates take over positions previously held by non-graduates,

(c) a reduction in the advantages of college-trained manpower in terms of income (without any change in the relation of educational attainment and positions).

In the debates in the Federal Republic of Germany on the adjustment processes in the labour market to the rising supply of graduates, a clear-cut distinction according to the types of adjustment process can seldom be found.

There have been some measures to ease horizontal and vertical substitution to a certain extent, but in general there remained a fairly close relation between subject of training and occupational field. It was also true for the level of education and access to positions.

Therefore, it seems doubtful that the expansion of the number of graduates will be accompanied by a corresponding increase of flexibility of the employment system. There have been increasing signs of counteracting measures; thus, many experts consider special measures to be necessary if frictions are to be avoided, be it through measures to increase flexibility or through special programmes for the employment of graduates.

Finally, income advantages of college graduates have been somewhat reduced by special wage increases for persons in lower ranks and due to substitution effects. However, there have not been any substantial changes in the pay-scale in general. A proposal made by a political scientist to slice off a few per cent of the income of higher civil servants and to take this amount of money for establishing new positions for graduates in the public sector raised considerable interest in the debates on changing relations between higher education and employment, but it did not lead to any corresponding measures, except for a few voluntary initiatives. Some action has been taken, however, to reduce the wages of highly qualified persons indirectly by means of providing positions on a part-time basis. For example, some states established quite a number of "two-thirds time" positions for teachers.

Summarizing the findings of this section, we might conclude that there are adjustment processes in the labour market towards the new pattern of supply. However, this again does not lead to the feeling of a perfect "match".

6.5 The impact on work

As the high supply of graduates has not been neutralized completely by changes in enrolment, structure of education, curricula, or adjustment processes in the labour market, we may assume that the supply creates a pressure for change in the job rôles and even in the organization of work.

Five different kinds of such changes in work in response to the larger supply may be mentioned:

1. The extension of the number of existing job rôles for highly qualified manpower: the most obvious example of this kind was the increase of positions for school teachers. The large supply of graduates, their demand to be employed and the problems in the schools under the existing pupil/teacher ratios obviously have led state governments to employ more teachers than otherwise would have been expected.

In this way, some improvement was possible in schools, and certainly deliberations to cut back the number of teachers came to a halt for the time being.

2. Many proposals have been made to utilize the additional supply of graduates for new tasks which have been generally considered to be important, but were neglected previously such as innovative effects in research, increase in the quality of social work, health, press, preparation of political decision-making, counselling services, military, police, city planning, security of the work place, etc. It was generally accepted that there were "requirements" that had not been transformed into a "demand" on the labour market.

Special programmes for creating new positions for college graduates met many criticisms, too. For example, some trade union representatives argued that these measures would serve, if they were not incorporated into general programmes for full employment, to reduce what are only minor problems of the privileged few. Trade unions also argued that many special programmes offering lower remuneration and job security would lead to a cut-back of both income and rights of employees in general. There is also criticism on the costs necessary for the realization of the programmes, and their utility. Many graduates getting jobs within the framework of special programmes are quite unhappy about the special status and the tasks involved.

3. Jobs previously considered to be suitable for non-graduates might change their characteristics after having been taken over by university graduates. There are obvious examples not only in cases of the up-grading of the training, for example in social work and pre-school education, but also in occupational fields less structured by credentials, such as the press and supportive staff of politicians. There is some concern amongst employers that in many cases the employment of college graduates would result in less efficiency rather than useful innovation. Lack of data does not permit us to estimate the extent to which the take-over of positions by graduates proves innovative, but known cases might justify the view that there are ample opportunities of this kind.

4. The large supply of college-trained labour might change the division of labour in the long run. When graduates actively shape their work rôles, previously considered not to require college education, such a change will have, in many cases, influence on other rôles too, be it in new tasks partly taken over by others, or new divisions of job tasks. Also it is known that employers' programmes to rationalize work take into account, to some extent, the availability or scarcity of skills, as well as the motivation of the work force. Therefore, some long-term effects can be expected. Again, lack of information prevents us from giving an account of the range of such changes.

5. Finally, the large supply of college-trained labour might have an effect on the interchange within the employment system, i.e., the system of organized gainful work and other spheres of socially relevant work. The increasing number of college-trained persons has an effect on the patterns of non-paid activities, for example the extension of political and cultural activities, new types of counselling services, voluntary social work, experiments in alternative living modes and new leisure activities. These changes in non-paid activities obviously have very divergent feedback effects on the employment system, such as increased interest in part-time work, reduction of paid jobs because of the transfer of the work from paid work to voluntary work, reduced motivation for self-realization in the work rôle, newly remunerated jobs in the service sector and the establishment of positions in the public administration. There is a growing awareness of changes of this kind, but it is difficult to predict the impact that these developments would have on the employment of college-trained manpower.

In the public debates held in the Federal Republic of Germany on the possible forms of utilization of a large supply of college graduates, there is a widespread belief that positions in the public sector have to play a major rôle. Many proposals have been made in this direction. It is obvious, however, that there are many alternative possibilities. For example, there could be legal decisions or state activities on employment of college-trained manpower in the private sector, such as laws regulating the medical service system in enterprises, anti-pollution measures, etc. Giving subsidies may create more new jobs. The utilization of college-trained manpower itself is also changing, as has been pointed out by examples shown above, due to the deliberations of private employers on how to make the most efficient use of the skills of the employed and due to the activities of the graduates themselves.

In summary, one has to note that the effects of the large supply of highly-qualified manpower on work are clearly visible in the case of actions by public employers to increase the number of positions for graduates and the special programmes to induce unemployed college-trained labour to utilize their skills. Information is lacking on the gradual changes in the job rôles, utilization of the abilities of additional graduates employed in the private sector and the interchange between work in the employment system and non-paid work. The lack of information is certainly detrimental for a labour market policy which does not only take into account visible demand and supply of the labour market, but also the potential utility of "mismatches".

Chapter 2. Recent developments in higher education

A. HIGHER EDUCATION IN THE FEDERAL REPUBLIC OF GERMANY: A PLANNED OR MARKET SYSTEM? OR A THIRD WAY?

by Klaus Hüfner

1. Introduction

The study on Higher Education and the Labour Market in the Federal Republic of Germany[1] is an extremely useful attempt to analyse the systems of higher education and employment and their interrelationships. Particularly appreciated is the effort to combine different aims within one single survey, namely:

(a) to be descriptive in order to fill certain information gaps which exist due to the fact that most of the studies on higher education in the Federal Republic of Germany are only available in German;

(b) to show some of the specific features of higher education and employment in the Federal Republic of Germany; and

(c) to contribute to the present discussion of appropriate research strategies and approaches in order to analyse the interrelationships between higher education and the employment system in an adequate way.

However, the study does not develop its own theoretical concept which would allow a more consistent and comprehensive description of the past development and could lead to some more consistently derived conclusions about possible future developments. On the other hand, this would have been a very complex and difficult task, and could have been of only limited use within an international research project which unites studies of different methodological backgrounds and seeks comparative results, especially in the fields of higher education policy advice and guidance.

Since the study tries to deal only with some implications for developing countries and since no attempt has been made to deal with similar problems as they might occur in industrialized countries, the workshop held in Kassel was a welcome opportunity to fill this gap.

---

[1] Ulrich Teichler and Bikas C. Sanyal, Higher Education and the Labour Market in the Federal Republic of Germany, op.cit.1982.

It is for this reason that I would like to deal, first of all, with some more theoretical aspects of the notion of educational planning in different types of state organizations. Afterwards, some more specific features of the present situation of higher education in the Federal Republic of Germany should be elaborated.

2 A continuum between the notions of a perfect market and central planning system

If we look upon the ideal type model of a continuum which links the two extremes of the perfect market system on the one side, and the central planning system on the other, higher education and employment systems in industrialized countries of the northern hemisphere of the world can be placed into, at least, three categories:

(a) the two decentralized systems of higher education in Canada and the United States which operate within the context and under the rules of market economies and can be located closer to the one extreme; in the words of Martin Trow: "We are, of course, dealing with a phenomenon unique to the United States, one that resembles the birth and death of small businesses in modern economies, and the patterns of success and failure of small capitalist entrepreneurs. This is the sharp contrast with the slow, deliberately planned creation of institutions of higher and further education in most other advanced industrial societies, or their even slower and rarer termination. And this points to the very strong link between higher education in the United States and the mechanisms of the market".[1]

(b) The relatively highly centralized higher education system of the socialist countries in Eastern Europe which function as integral parts within the context of planned national economies and can, therefore, be closer located to the other extreme: "The history and general principles of the development of the Soviet State, of its economy and culture and of its actual planning system have crystallized the basic chain of dependency and interrelation of the individual aspects of the problem of supply the skilled manpower needs of the economy in the USSR...

---

[1] Martin Trow, Markets and Higher Education, Presentation at Seventh Annual James Madison University Fall Arts and Science Symposium Nature and Civilization Series, October 1980, Harrisonburg, Virginia, pp.2-3(mimeo).

> ...
> The Soviet, like any other system of manpower training, being an integral part of the entire economic organism in its development, may be most completely understood only in conjunction with those changes which take place in the socio-economic structure of society".[1]

And finally:

(c) the countries of Western Europe, including the Federal Republic of Germany, which can be placed somewhere inbetween, depending upon:
- the relationship between, in most cases, publicly financed higher education systems and varying types of so-called social market economies, and
- varying degrees of centralization/decentralization.

In other words, the Western European group of OECD countries is much more heterogeneous and difficult to locate in our continuum than countries of the other two groups although it must be pointed out that major differences also occur between the countries within those two groups.

In the Federal Republic of Germany, the planning of higher education constitutes a "mixed" type which is:
- neither completely organized in such a way that the parts of the system hold together through a common membership in a series of so-called free markets for students, faculty, support, prestige, etc.
- nor is it entirely organized in such a way that the political administrative system is in charge of planning all subsystems of society, as is the case of the socialist type of so-called democratic centralism.

These differences between the three categories mentioned above do not imply that the planning problems of higher education systems, their structures and functions are basically different. The problem-solving mechanisms, however, must necessarily differ according to the different notions of economic and social planning in general and of higher education planning in particular.

In the United States, for example, very high proportions of students attend colleges where they receive a broad, non-specialized education; as a result of this they have a high degree of occupational flexibility. This implies a high adaptibility and substitutability in "jobs" within a fairly "fuzzy" occupation structure. Manpower shortages are barely thought of as real key problems. Instead one relies in the United States on adjustments in manpower utilization through large numbers of retraining programmes rather than on forecasting large-term shortages or surplus.

In contrast to the United States, "in the Soviet Union, prime importance is accorded to the perfecting of the planning mechanism which remains a regular priority at the highest level of the economic policy of the State".[1] A complex procedure for long- and short-term plans of socio-economic development is institutionalized dealing with:

---

[1] I.V. Ivanov, Skilled Manpower Planning, Forecasting and Training in the USSR, Paris, IIEP, June 1982, pp.2-3, (mimeo).

(a) 20 year programmes of scientific and technological progress and five-year built-in revision possibilities,

(b) 20 year drafts of the main options of economic and social development and five-year revision options, and

(c) annual control mechanisms for each subsequent five-year plan period - all of them integrated and structured within the multi-level planning set-up and differentiated according to sectors/branches and geographic areas.

3. Three educational programming approaches

It is interesting to note that, at the level of educational programming (i.e. setting of plans), there are three main approaches to be distinguished which correspond to the three different categories mentioned above:

(a) At the one end of the continuum the rate-of-return approach which, inter alia, implicitly assumes that educational programming should proceed on the basis of cost and benefit analyses where the direction of price signals counts and actual numbers of persons of different qualifications needed for specific requirements on the labour market do not matter.[2]

This approach is supposed to help identify any labour market imperfections. The thinking and practice in the United States move very much along these lines of educational programming and indicate that the notion of planning higher education has only a limited intrinsic value It is, first of all, the so-called free market which allocates the resources on the higher education market: "Now the important elements of market in higher education are: that as compared with other forms of social action, the outcomes are not the results of planning or central purposive decisions and secondly, when the sellers (producers) are relatively numerous, their behaviours are marked by competition among them for the custom of the buyers. And that strengthens the influence of the buyers in the market over the character and quality of the product, indeed the very character of the producer. We can see this both when the buyers are students, and the producers, the colleges and universities, compete for their enrolment. We can see it also when the sellers are graduates competing for relatively few job openings, for example, in academic positions".[1] If at all necessary, so-called planning takes place at the institutional level and implies the pure management of problems - something which differs, for example, fundamentally from socialist education planning in the centrally planned economies of Eastern Europe.

---

[1] D. Chuprunov, R. Avakov, E. Jiltsov, Higher Education, Employment and Technological Progress in the USSR, op.cit. 1982.

[2] It should be noted that this (rate-of-return) approach has not been explicitedly discussed in the Teichler/Sanyal study although some statistical comments on the relationship between education and income have been made.

(b) On the other extreme of our continuum the manpower forecasting approach is used as an educational programming technique which is the central base of all integrated planning activities. In other words, in socialist countries such as, for example, the Soviet Union, there is a decision-making system which applies this programming technique thereby linking all sectors of economic, social and educational activities: "It is obvious that analysis cannot be limited to macromodels which only give general orientation. The level of the next type of model, currently used in higher educational planning, is the determination of the dynamic of the needs for specialists at the level of large groups of specializations, and within each group. The sectorial principle (by economic branch) is complemented by the geographical principle - elaboration of forecasts of needs according to economic region. Let us emphasize, finally, an innovation such as the attempt to elaborate the analysis of needs on a minutely detailed basis of construction of the long-term multivariant model of the specialist".[2] Of course, prices are also used within this context, but their value as signals ("economic levers") is part of the planning context and not a substitute for it.

(c) Now let us turn to the situation in the Federal Republic of Germany which is much more confusing: "There is little effective centralization, but not much of a market economy either. Rather, there is the continuously modernized society:

- the network of formalized linkages between various certifying educational programmes and formalized job categories with substantial political rights. To the market observer, it looks like a byzantine version of

---

[1] Martin Trow, op.cit., p.5.

[2] D. Chuprunov, R. Avakov, E. Jiltsov, op.cit., p.106.

> a market. I assume to a more centralized observer it looks like a byzantine version of a state".[1]
>
> Whereas the rate-of-return approach as an educational programming technique is not compatible with the notion of higher education as a state activity, the manpower requirement approach is incompatible with the market notion of the prevailing economic order.

In other words, there are in the Federal Republic of Germany neither at the Federal nor at the Länder level decision-makers/ministries applying one of the programming techniques as a binding framework for educational and manpower planning. The debates which took place around these techniques as well as their applications are mainly activities of applied research institutes and serve, if at all, as an orientation function for educational policy measures.

Correspondingly, a third approach dominated in the Federal Republic of Germany which was supposed to bridge the dilemma of educational planning in the country, namely the social demand approach. This educational programming technique is used in order to identify a possible over- or under-supply of student places by relating anticipated or desired outputs of the higher educational system (= "social demand") with the supply side of the higher education market. The links with labour market requirements are only, if at all, informally anticipated. In other words, the social demand approach is much more internally oriented. Since the flexibility of adaptation processes of the state-controlled systems of higher education is much lower than, for example, in the United States, the individual as well as societal risks of educational misinvestments are especially high.

4. The case of the Federal Republic of Germany: A new third way?

Perhaps, John Meyer is right when he argues that the occupational-educational linkages are built on images of moral community: "In such a situation, the planner should function as a moralist, relying less on power or technical adequacy than on alternative arrangements, and approaching the educational-occupation matrix with the spirit of a moral accountant".[2]

However, since the social demand approach, which had been mainly an approach of economic affluence of the sixties, is no longer applicable, new solutions must be found in the light of present and coming economic-financial tensions within and between the system of higher education and employment in the Federal Republic of Germany.

---

[1] John Meyer, Some Reflections on the Issues of the Kassel Workshop, Kassel, January 1983, p.4. (mimeo).

[2] Ibid, p.4.

Let us, first of all, look at the input side of higher education: In 1976 we had about 166,000 first-year students. As from 1982, more than 215,000 students will be admitted yearly reaching a peak of 254,000 in 1986. Correspondingly, the overall student body will increase from about 1 million in 1980 to almost 1.4 million around 1988.

Now, let us look at the output side of the higher education system: In the late seventies we had an annual output of about 120,000 graduates. During the eighties the number will continuously increase reaching its peak in 1991 with about 215,000 graduates.

These developments on the one side as well as economic constraints on the other indicate that the "interesting mix between market-oriented and planned relationships of higher education and employment"[1] has to be redefined. New planning strategies must be developed in the light of:

- the demographic wave of the "million corridor" of the years 1961 to 1967 now entering the system of higher education,
- no further expansion demand of the public sector which absorbed during the years of the "golden age of higher education" about two-thirds of the graduates,
- negligible replacement demand prospects due to a relatively low average age of those graduates employed in the public sector, and
- a continuing increase of academic unemployment.

At the Federal and Länder level the educational planning authorities are confronted with the problems of "tunnelling the peak" during the eighties and of "bridging the gulf" in the nineties. In the Teichler/Sanyal study it has been stated correctly that the dominant approach was "neither to submit adjustment processes more or less to market forces, nor to choose a certain consistent philosophy of higher education planning, but rather to seek for a compromise of moderate planning".[2]

Given the trends mentioned above it can be assumed that a shift within the slogan of "planning as much as possible, market as much as necessary" toward the introduction of more market elements will be necessary. Knowing that individual higher education demand behaviour reacts extremely quickly and sensitively to changes in environmental conditions it can also be assumed that long-term planned oscillations of boom and bust phases of student enrolments in higher education of the past might be substituted by medium-term "cobwebs" on the markets of both the systems of higher education and employment.

Based upon these assumptions, an analysis of present and future conditions for individual universities in the Federal Republic of Germany seems to be useful. Looking from the

[1] Ulrich Teichler and Bikas C. Sanyal, op.cit.

[2] Ibid.

institutional level, from the university point of view, one has to take into account the following constraints:

(a) The overall educational system competes with other societal problem areas: to-day, it is no longer at the top of the priority list as it was at the end of the sixties. In other words, the "political attention" cycle has changed tremendously.

(b) Furthermore, within the field of educational policy higher education lost its priority during the mid-seventies. As a percentage of total public expenditures, the share of higher education expenditures went down from 3.8 per cent in 1975 (where it reached the peak) to 3.4 per cent in 1981.

(c) Due to the scarcity of public resources further cuts can be expected in the forthcoming years. These will be primarily at the *Länder* level where educational budgets will be cut because of their order of magnitude (in 1981, over 95 per cent of higher education expenditures were borne by the *Länder*) and the anticipated bust phase of student numbers in the nineties.

These overall developments call for a new orientation at the societal as well as the institutional level of higher education. Today, the legal-institutional preconditions for "higher education in a social market economy" are not given. These require a complete rethinking in terms of a new research strategy which analyses and compares past, present and necessary future decision-making processes on and within higher education institutions. Obviously, the system of higher education in the Federal Republic of Germany can be characterized as being "backward" in terms of modernization requirements for a post-industrial society. In other words, an institutional-economic theory of higher education is necessary which combines the requirements of (a) external functionality and (b) internal rationality.

Today, the main issue is no longer one of elite versus mass education, but one of formulating and implementing the necessary institutional requirements for mass universities which permit highly differentiated education programmes even within individual institutions. In other words, not mass education *per se* is questioned, but the inappropriateness of present types of differentiation and of study organization in German higher education.

Now, if we ask for a new institutional-structural set-up of higher education in the Federal Republic of Germany, two alternative ways - as mentioned above - can be distinguished. One possibility would be central planning and control, whereas the other extreme would be a market system of mixed university financing, private universities, etc. A compromise solution could be a public decentralized planning system using "economic levers" - a third way which would also increase the flexibility of the higher education system at the institutional supply side.

In other words, the old slogan must be changed into "market as much as possible, planning as much as necessary" combined with a clear understanding that the market notion does not replace the planning notion. This new planning ideology implies some major structural changes in the higher education system of the Federal Republic of Germany. Unfortunately, at present, rigid state control over institutions of higher education is increasing, making the necessary steps more or less impossible.[1]

Present measures at the Bund and Länder level lead to one-sided effects as, for example, in the case of public student support schemes. When one changes the present system of a mixed combination of grants and loans to a pure system of loans, then an increase in competition among students can be expected, having, however, no corresponding competition on the side of educational supply, that is to say among the university teachers who are civil servants with life-time tenure. This policy measure does not improve the overall situation. It only means that administrative numerus clausus steering measures are replaced by price-oriented regulation mechanisms on the demand, but not on the supply side of the higher education market. Economic incentives do not lead to an improved allocation unless both sides of this market are included.

In order to guarantee equality of opportunity in a modern society on both the higher education market as well as the labour market for graduates, the requirements of external functionality and internal rationality have to be combined in a "social market model for higher education". Public ad hoc crisis management whether at the national, regional or institutional level does not overcome the present structural, functional and financial crisis of higher education.

Searching for an alternative reform model of higher education finance implies neither the implementation of a "pure" market model nor the giving up of planning the higher education system within the given economic order of a social market economy in the Federal Republic of Germany. Teaching and research activities require a minimum of overall capacity planning; to a certain extent, public manpower requirements planning is necessary in order to determine the overall development of higher education, although the traditional argument that the state is the biggest client for highly qualified manpower must be questioned today.

Therefore, it is not a question of whether the US model of higher education can be transplanted to the Federal Republic of Germany, but whether elements of this system can be applied one way or the other in parts of German higher education in order to consolidate it.

---

[1] The conclusions of the Teichler/Sanyal study can only be accepted if the necessary structural, more market-oriented incentives are introduced. Otherwise, they become contradictions per se, as indicated in the study in the case of curriculum reform.

A social market model in higher education implies structural changes at three levels, namely (a) in the relationships between the state and the higher education system, (b) within the public higher education system, and (c) within individual institutions of higher education.

In order to realize the market principle at the macro level, the state should no longer finally support institutions of higher education directly (exceptional cases could be, however, new institutional foundations, integration measures, institutionalization of new programmes, university building measures, where the state should offer some pre-investments for a limited period).

Teaching activities should be financed via study fees which are to be paid by the students who receive for their general university education public vouchers and are free to make their own decisions where to go and what to study. The main function of the state vis-à-vis the institutions of higher education is one of "quality control" (curricula, examination standards, etc.).

The research activities of the institutions of higher education should be financed through a "research market" where the demand side consists of state and other public and private institutions.

The main task of the state is to guarantee the conditions of competition on both markets, namely the teaching and the research market.

It is assumed that institutions of higher education can adapt the supply of teaching and research services under the social market conditions in a much more flexible way than any public administration could do. It can also be assumed that individual institutions offer differentiated teaching programmes not only in quantity but also in quality.

Institutions of higher education which are forced to orient themselves on a competitive market are permanently confronted with an assessment of their institutional performance. The detailed knowledge of the cost structure of single teaching units becomes a must. Institutions are forced to account the average cost per study place in the different fields of study. In contrast to presently existing organization forms the social market model offers the individual planning units at different decision-making levels of the institution (e.g. faculties, institutes) a higher degree of independence. Not only the cost per student place but also the teaching and research capacities can be determined in a decentralized system. The more successful faculties can increase their resources, whereas the less successful ones are forced to close if they do not find ways of developing new innovative study programmes and/or research activities.

One of the basic assumptions of this new model refers to a differentiated scheme of financing the teaching activities. Whereas the general education leading to a first degree will be financed by public vouchers to be used on the basis of individual decisions by the "consumers", the vocational specialization period with a duration between two and four semesters must be either financed by students' loans and/or by their future employers. The final phase leading to a Ph.D. must be individually financed by research grants which can be received from the state, churches, foundations, trade unions, employers organizations or the institutions of higher education themselves (which are interested in promoting their own academic junior staff).

This plea in favour of different sources of finance in a social market model can be justified if the institutions of higher education receive a relatively high degree of autonomy in terms of determining their own supply of different programmes/ courses and their own allocation of resources and if the major function of the state is one of "quality control". Although the state also finances indirectly, namely via the students, parts of the teaching and research activities, the individual institution of higher education is - in contrast to the present situation in the Federal Republic of Germany - in a competitive situation with a high degree of (forced) flexibility and of (necessary) decentralized autonomy - features of a system which are also non-existent today.

Due to the present structure of public finance and state control practically no economic and/or non-economic incentives exist for those institutions which produce increased and/or improved outputs of different kinds. For the time being, there are no generally accepted indicators of performance or "proxy variables" which could allow higher education institutions to stabilize or even expand those departments which are successful and productive and to reduce or even give up those departments which perform badly.

At present, an increasing bureaucratization of and within the institutions of higher education can be observed leading to processes of "creeping corruption"; under the umbrella of academic freedom, individual economic utility maximization is in contrast to the institutional and overall system requirements of further development. Input as well as output control is totally neglected and felt to be unnecessary (e.g. in the case of sabbatical semesters, fully financed by the state). For more than a third of the year the institutions are almost "empty". All this seems to be in contradiction to the present situation of increasing scarcity of resources.

Due to the trends mentioned above, competitive situations will occur and call for criteria of allocating scarce financial resources within departments and among departments of individual institutions of higher education. In addition to that, during the nineties a scarcity of students will occur due to the low birth rates of the late sixties and seventies. This will also lead to an increasing competition among institutions of higher education for students. Neither the criteria applied so far nor the institutional planning conditions given will allow a competitive system based upon market-oriented rules. The problems of securing resources (external orientation) and of allocating them (internal orientation) cannot be solved within the present system of higher education which is confronted with increasing constraints.

The present strategies of ad hoc crisis management and incrementalism cannot help to overcome the crisis of higher education in the Federal Republic of Germany. Incrementalism can only be a useful decision mechanism if there exists a social market model of higher education embedded in a medium- and long-term process of clearly defined and generally accepted goals of higher education policy. A further elaboration of the social market model might offer a new third way of planning higher education in the Federal Republic of Germany.

B. LABOUR MARKET AND EDUCATIONAL FORECASTS IN THE FEDERAL REPUBLIC OF GERMANY

by Manfred Tessaring

1. Introduction

Efforts to relate education and employment in the Federal Republic of Germany in the last two decades have brought out the considerable difficulties of long-term planning[1], the three most important of which should be mentioned:

(1) The educational system to be planned is only a part -- though an important one -- of the whole economic and social system which mostly is not centrally planned. Moreover, the only legal task of educational planning in the Federal Republic of Germany is to meet people's future social demand for education and thus to provide them with suitable educational and training opportunities. The economic need for manpower and financial restraints are only a additional variable of planning, not a predominant one.
Despite that, there is a variety of planning and projection activities in this field, mostly undertaken by public, private or semi-public research institutes. An official integral planning of the educational system for the Federal Republic of Germany as a whole does not exist because the legal task of the *Länder* is to supervise educational and cultural matters. The first overall plan at the Federal level, the basic educational plan (Bildungsgesamtplan) of 1973, was not implemented because of divergent policy measures and targets between

---

[1] For a more detailed analysis see M. Tessaring, *An Evaluation of Labour Market and Educational Forecasts in the Federal Republic of Germany*, Paris: IIEP 1982, mimeo. (IIEP/S85/6) - Rev. 1). For an evaluation of general labour market, occupational, qualification and technological forecasts, also see Dieter Mertens (ed.), *Das prognostizierte Jahrzehnt. Die siebziger Jahre - Vorausschau und Wirklichkeit*, Schwerpunktheft der Mitteilungen aus der Arbeitsmarkt-und Berufsforschung, No. 3, 1980 (Summaries in English and French available).

the Länder and because of financial restrictions posed by the finance ministries. A new attempt for an integral basic educational plan in 1981 did not succeed in the planning stage up to now mainly for the same reasons.

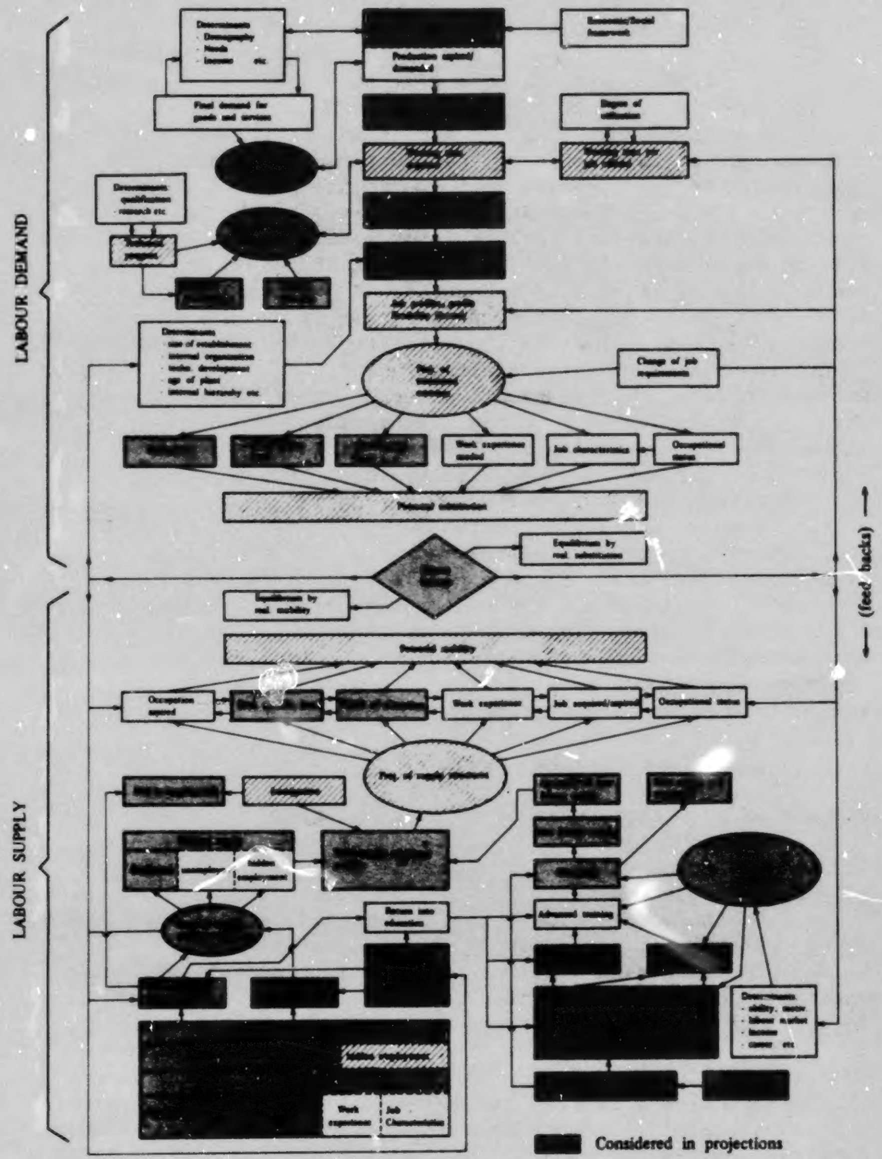
(2) In a market-oriented economy like that of the Federal Republic of Germany, planning or forecasting institutions must bear in mind the "magic triangle" of projections between time space period covered, specification, and accuracy of forecasting results. The more detailed a projection the less it is accurate ; the longer the projection period the less very specified elements of the projection can be expected to be realized.
In the case of qualified manpower projections there is one additional problem - or opportunity (this depends upon the point of view): Most disciplines do not train "specialists" for certain well-defined job tasks but rather offer contents and knowledge applicable in various labour market segments. It is rather difficult to trace the potentials of utilization as in the substitution and mobility processes in the past ; to forecast them is quite impossible. Not to consider them would mean neglecting important adjustment processes taking place in the labour market every day (Figure 1).

(3) There is a lack of adequate methods and data necessary for manpower forecasting. For example, the next population census after 1970 will not take place before 1985. Therefore, manpower requirement approaches, social demand approaches, econometric models etc. cannot, as has been pointed out before, predict real developments for specific manpower groups even in the medium term. This will be illustrated in section 3.

2. Recent Labour Market Problems

Before turning projections in detail, recent problems of the educational and overall labour market development in the Federal Republic of Germany shall be discussed briefly. The first major problem is the effect of demographic cycles. At present the demographic wave is at its culmination point concerning the entry of young people into either apprenticeship training or employment. This is an effect of the "baby boom" of 1955-1970 (maximum 1965) ; it leads to high demand for training and job opportunities - first at the level of vocational training, followed by the medium-level training sector in the mid-eighties and finally by college-trained people at the beginning of the nineties.

Figure 1. The procedures of labour demand and labour supply projections.


LABOUR DEMAND
LABOUR SUPPLY
(feed backs)
Determinants
- Demography
- Needs
- Income etc
Production output/demand
Economic/Social framework
Final demand for goods and services
Degree of utilisation
Determinants qualification
- research etc
Technical progress
Job profiles
Determinants
- size of establishment
- internal organisation
- techn. development
- age of plant
- internal hierarchy etc
Change of job requirements
Work experience needed
Job characteristics
Occupational status
Potential substitution
Equilibrium by real substitution
Equilibrium by real mobility
Potential mobility
Occupation aspired
Work experience
Job acquired/aspired
Occupational status
hidden unemployment
Return into education
Advanced training
Work experience
Job Characteristics
Determinants
- ability, motiv.
- labour market
- income
- career etc

■ Considered in projections

▨ Considered but not separately projected in most forecasts

□ To be considered but not integrated in most projections

BEST COPY AVAILABLE

These demographic problems are aggravated by a second major labour marker problem -- the high number of foreign workers in the Federal Republic of Germany ; there are about 2.5 millions foreign workers representing about 10 per cent of the total labour force. Their children having less education and training opportunities will seek jobs opportunities increasingly in the next 10-20 years and thus reinforce the demographic problems. There is almost no likelihood of realizing economic growth rates of 4 - 5 per cent p.a. in real terms which are considered necessary to solve the global labour market imbalance at least in the nineties. In the next 10 years, the net increase of labour force will be more than one million persons in addition to the stock of more than 2 million unemployed persons today. The number of jobs available are expected to decrease to at least the same extent due to new technologies. The negative impact of technological progress is not restricted to the production sector, as the new developments in office and communication technologies show. Up to the mid-nineties we will be facing the widest gap between labour supply and jobs available ever known in the Federal Republic of Germany. Figure 2 illustrates this gap.

Another problem concerns new tendencies in the attitudes of the younger generation towards work. It may be described in terms of a growing "shadow economy" or "hidden economy", or the growing number of young people detesting conventional forms of life and work. For some researchers it is even more: a first step towards the "post-industrial economy", where materialistic needs -- as well as quantitative growth of production -- become less important than personal autonomy, self-determination and "useful" production.

3. General Labour Market Projections

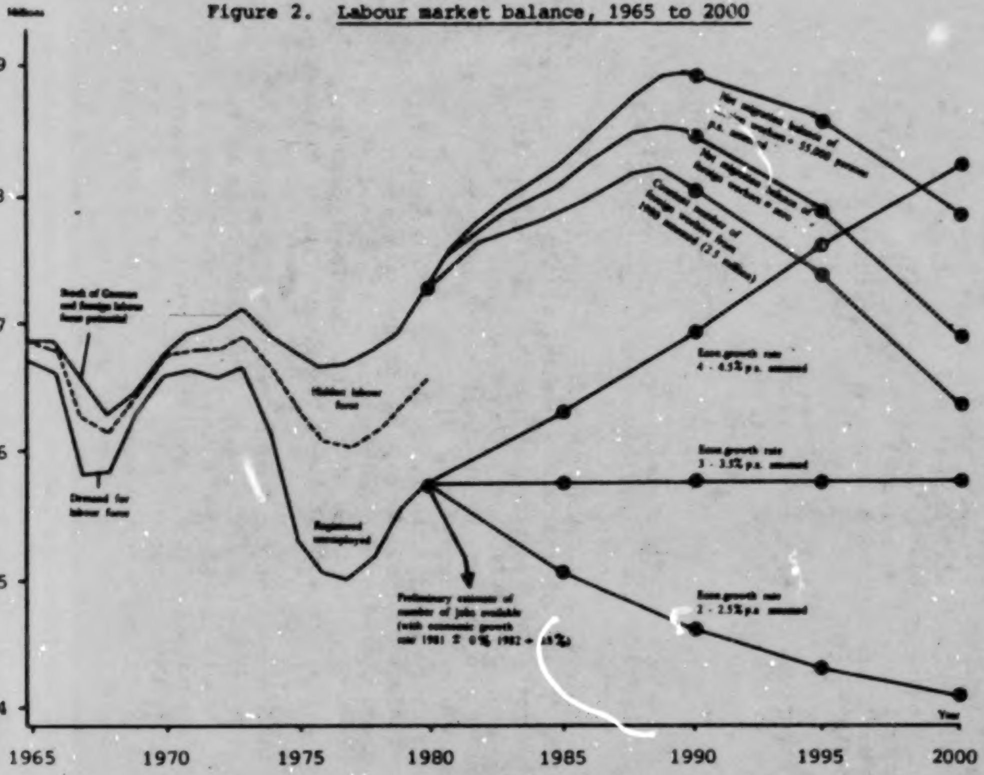
The aim of this section is to give an overview of medium and long-term labour market forecasting activities in the Federal Republic of Germany. A restriction is made in considering only macro-projections.

- on the supply side structured by age, sex, occupational status and, if possible, by nationality,
- on the demand side structured mainly by economic sectors.

The first long-term projection of labour supply in the Federal Republic of Germany was carried out by the Deutsches Institut für Wirtschaftsforschung (Berlin) in 1959. It was followed by several supply and demand projections done by research institutes. First in 1964 the government (Ministry for Labour and Social Affairs) presented a projection of long-term labour supply which was followed by other ministries for their specific purposes. In order to co-ordinate official forecasting activities in 1968 an Inter-Ministerial Information

BEST COPY AVAILABLE

Figure 2. Labour market balance, 1965 to 2000



Source: Klauder/Schnur/Thon (1982), op.cit.

BEST COPY AVAILABLE

and Co-ordination Board for Labour Force Projections was established. Within the framework of this committee a working group was formed, engaged with long-term-projections of the work force. Members of this working group were representatives of all federal ministries affected by these questions and of the Federal Monetary Board, the Federal Statistical Agency and of the Institute of Employment and Occupational Research at the Federal Institute of Labour.

According to the special tasks of these organizations the aims of the respective members were:

1. Projection of labour market developments,
2. Projection of economic developments (GDP, productivity),
3. Planning of the state budget, fiscal policy interests,
4. Co-ordination of medium-term economic policy in the European Community,
5. Regional development planning.

Forecasts of research institutes dealing with special aspects and the development of forecasting methods are widely utilized for official forecasting activities. So, in 1975, the Battelle Institute worked out the first supply model in a very differenciated way and allowing numerous simulations.

The forecasting activity of the Deutsches Institut für Wirtschaftsforschung is nowadays concentrated on the demand side, disaggregated by economic sectors and occupations using mainly production functions of the Cobb-Douglas type. Input-output analyses are added to test the consistency of forecasting results.

The forecasts of the Prognos Institute (Basel) deal mainly with regional aspects, e.g. for aims of urban and regional planning or of developments in European countries.

The Institute of Employment and Occupational Research (Nuremberg), the forecasting activities of which are explicitly stressed in the Employment Promotion Act, focusses its attention on substantiating alternative design possibilities of labour market policy. This is done by structured labour market forecasts using the potential labour force and manpower utilization concept. Various alternatives are calculated, both on the supply side (e.g. labour force participation rates, supply of foreign workers) as well as on the demand side (e.g. variations of economic growth rates of labour productivity, working time).

Also to be mentioned, other research institutes and organizations carrying out projections for special subjects and interests, for example the Wirtschafts- und Sozialwissenschaftliches Institut of the German trade unions, the Institut der Deutschen Wirtschaft of German employers association, etc.

Between most of these institutes and ministries exist permanent exchanges of information concerning the data base, methods, and assumptions. Nevertheless each institute has its own specific forecast design; therefore a comparison is not easy in many cases. Interpretations of different results must bear in mind those distinct approaches. An evaluation of long-term labour market forecasts in concreto appears for the reasons mentioned above rather difficult. Firstly, the statistical bases for projections of the components of labour market development are very heterogeneous. Secondly, the groups of persons under consideration range from the German labour force alone to the inclusion of foreign workers in the reference year with assumption of zero migration and to models taking into account economically induced immigrations.

Similar restrictions are being made regarding conceptual differences: Some projections only consider the labour force (i.e. gainfully employed persons + unemployed), others the labour force uninfluenced by business cycles (by level correction in the basic year), and still others calculate the potential labour force (i.e. labour force employed/unemployed + hidden labour force).

The necessary assumption of an unchanging general social and legal framework in the projections leads to grave discrepancies compared to actual development when, as nowadays, a serious change-over of social, legal and economic background occurs. Some of the obvious reasons not foreseeable have been the cessation of the system of fixed exchange rates, the rapid rise of raw material and energy prices, and legal changes such as the introduction of the 9th and 10th year of compulsory school attendance and the introduction of flexible retirement age. Additionally, strong changes in labour force activity took place in the last decade induced by the educational expansion, decreasing activity rates among older workers and a generally increasing participation of women, in the labour force.

A comparison of long-term forecasts of labour supply with actual development up to 1980 shows rather serious discrepancies. The range of forecasted labour supply in 1980 was from 26.4 to 28.5 million (foreign workers included) and from 24.6 to 26.2 million (German labour force only), whereas in 1980 the effective labour force consisted of 24.5 million Germans and 2.1 million foreign workers. The main reasons for these differences were the decrease of male activity rates both by extension of the compulsory school attendance and the introduction of early retirement schemes, and that the real increase of women's labour force participation rate has generally been underestimated in the projections.

Inter-comparisons of demand projections as well as the comparison with reality are to a high degree submitted to statistical, conceptual and methodological restrictions. For these reasons the evaluation should focus on rates of change and on structural patterns of the economic sectors rather than on absolute numbers.

Long-term demand projections, as produced by official organizations or research institutes are in the following overview divided into their main components like growth of GDP, labour productivity and labour force demand.

The growth of real GDP in the seventies was estimated at annual rates from 1 per cent to 5.4 per cent, whereas over these years (1970-79) the actual average growth rate was 2.8 per cent. The productivity rate of labour (real GDP per gainfully employer person) was actually lower in the past decade than projected in most studies.

The labour force demand resulting from the (tautological) relation between real GDP and labour productivity was strongly influenced by the economic recession of 1974/75. It is obvious that this break in the economic trend has been taken into account only by new forecasts. Additionally it must be mentioned that the population census of 1970 showed a labour force of almost 700 000 persons less compared to the annually calculated population updatings from 1961 - 1970. These current population figures, which were the basis for forecasts, therefore led to a lower productivity and higher employment level than observed.

Despite all of these difficulties the basic trends of sectoral labour demand were forecast with sufficient accuracy. This refers especially to the primary economic sector. The trend break of decreasing labour demand in the secondary sector was correctly forecast, too, but has in its dimension been underestimated by most projections. Correspondingly, the high increase of labour demand in the tertiary sector was truly forecast in its direction but underestimated in its level. It must be repeated that the economic recession affected the tertiary sector and its labour demand much less than most other sectors.

The balance of labour supply and demand should show the future number of (registered or hidden) unemployed. For several reasons many forecasters hesitate to balance their results. The main reason is that even relatively small errors in supply and demand estimations do have serious effects on the level of unemployment. Furthermore it is difficult to subdivide a projected gap in labour market balance into registered unemployment, hidden unemployment or employment of foreign workers (as "disposition quantity for labour market adjustments"). For the comparison of projected labour market balances to the actual situation, a differentiation must be made between alternate projections (status quo or trend type) and goal projections (political alternative). Because of the wide spread alternations considered, the range of alternate forecasting results included real development in most cases. Goal projections show a rather fair harmony with real employment situation only up to the year 1973. For the following years the goals set were but illusory. Compared with projected unemployment rates varying from 0.7 per cent to 1.5 per cent in 1980, the actual unemployment rates were: 4.7 per cent (1975), 3.8 per cent (1979 and 1980), 5.5 per cent (1981) and more than 7 per cent in 1982. Long-term labour market projections -- one might conclude -- did (and could) not foresee the severe economic rupture in 1974/75 as well as the change in work and life attitudes of people, as expressed by criticism towards economic growth, technological development, energy and ecological problems and towards the function of determined work of the individual. According to the projection results and the assumptions made for estimating manpower supply and demand relatively tolerable projection "errors" were made for

- the overall development of German labour supply,
- the labour force participation rates of middle-aged persons,
- the decrease of employment in the primary economic sector and the increase in the tertiary sector.

Relatively serious discrepancies between projection results and reality relate to

- the decrease of labour participation of younger and older people,
- the increased number of foreign workers,
- the employment situation in manufacturing and commercial sectors,
- the growth of GDP and labour productivity,
- the development of labour demand and unemployment resulting from the economic recession of 1974/75.

These findings call for very careful interpretations of the value of long-term forecasting results. Projections are only capable of predicting basic changes in the labour market structure or the direction of the main components. They should consider alternative possibilities of future development by calculating several sets of different assumptions.

4. Supply and Demand Forecasts for Highly Qualified Manpower

Far more projections have been made regarding highly qualified manpower (HQM) than regarding any other groups - despite the fact that the HQM represent only a relatively small quantity of total manpower. The reasons for this concentration on HQM are not only the much better statistical data available for this group. University attainment is widely regarded as an indicator for the skill level of a nation allowing for judgements on its economic and social progress and its competitive position compared to other industrial countries. Furthermore, advances in educational attainment are seen as a graduator for cultural and political perception of the population implying responsible participation in all spheres of life. Not to be denied is the often discussed danger that higher qualification enables people to be more conscious of social and economic abuses with the risk of disturbances. This could be the case, if, for instance, the jobs offered do not correspond to the skills achieved. Such quantitative and qualitative imbalances could cause both individual disillusion and dissatisfaction with society as well as a misallocation of resources that might have been used for other purposes.

The actual stock of employed university graduates in 1980 was 1.45 million persons. Projections on the basis of the social demand vis-à-vis the manpower requirement approach (modified for some groups by projections or density ratios) vary from 1.3 million to 1.66 million. The HQM-ratio (percentage of HQM to total labour force) actually being about 6 per cent in 1980 was projected with less than 5 per cent to about 6.5 per cent. With regard to the discrepancies of realized and projected numbers of university entrants and students, these projection errors of the whole supply and demand of HQM seem to be relatively small. The reason is the "inertness of statistical masses" influenced only by net differences between inflows and outflows into/out of the labour market. Thus, highly aggregated stocks and structures of labour force segments appear to be foreseeable rather sufficiently in medium-term projections - despite considerable differences in assumptions.

At present it is difficult to confront projected HQM supply by fields of study with the observed stocks. Up to 1978, the number of teachers increased to about 550,000, representing about 40 per cent of all employed university graduates. Projections of teacher supply and demand have calculated the actual numbers relatively exactly, with variations - dependent on different assumptions - from 520,000 to 700,000 (demand side) and from 530,000 to 611,000 persons (supply side).

Early projections of teacher demand were based on rather optimistic views about future needs to realize educational reforms, thought necessary to meet the requirements of technological and industrial progress. Declining birth rates since the mid-sixties together with a decrease in public personnel recruitment in the seventies (induced by financial constraints during the economic recession) caused a decline in teacher engagement and growing numbers of unemployed teachers.

This led to reactions both on the supply and demand side. On the supply side the ratio of students entering universities for teacher training dropped from more than 40 per cent (1974/75) to less than 20 per cent (1980/81) of all university entrants.

On the demand side part-time employment opportunities for teachers were offered with flexible working time models on a voluntary basis. These offers have not been accepted by graduates to the extent expected. But even if they were accepted, these measures probably are not sufficient to reduce the actual and projected high unemployment of teachers.

As far as graduates of other fields of study are concerned, for only some of them the employment situation at the end of the seventies/beginning of the eighties has been predicted with fair accuracy. The dangers connected with an orientation of individual decisions on projection results are often compared with the appearance of cobweb cycles, as they are known in economic theory.

An example of those cobweb cycles caused by projections of qualified manpower is the group of college-trained engineers. "Hostility to technology", "supply deficit for engineers" are the contemporary slogans in characterising the labour market for engineers. None of these slogans can be proved clearly by available data. University enrolments for engineering and natural sciences in fact dropped slightly in the years 1975-1980 and unemployment numbers were smaller than for most other university graduates. But these findings must be interpreted carefully. Enrolment numbers also declined for most other fields of university studies, due to a lessening interest to study. As for the employment situation, in 1981 there was a strong increase in the number of unemployed engineers and technicians, by about 50 per cent compared to 1980. This increase has been the highest out of all university graduates - except teachers.

The possible reasons for the above-mentioned slogans could only be interpreted as a short-term excess demand situation in some industrial branches. According to a 1982 survey, carried out by the Ifo-Institute for Economic Research (Munich), this unfavourable situation for engineers is not expected to last longer than two or three years.

On the enrolment side, this has already caused a significant reaction in students' choice of academic fields of study. Compared with 1980, enrolments in engineering and technical sciences increased by more than 20 per cent.

On the supply side, a deficit of young engineers cannot be discerned for the period 1970-1980 as a whole. In this decade the replacement demand for engineers can be calculated at about 80,000 engineers at college-level and about 26,000 at university-level. Compared to 123,000 young engineers leaving colleges and to 66,000 leaving universities in this period, an additional demand of 83,000 engineers would have been necessary to give adequate job opportunities to all college and university graduates with an engineering diploma.

The supply of young engineers being sufficient to meet economic demand, the question arises as to what were the reasons for stagnating enrolments in engineering studies on the one hand and the lamentations about too few engineers on the other.

The main reason for the first problem is widely seen in pessimistic results of projections on the future labour market for engineers which had been published in the mid-seventies. Up to 1970 projections had been rather optimistic. For example, the Association of German Electro-Engineers (VDE) argued on the basis of a 1970 projections:
"Altogether this study shows the demand of industry (for electrical engineers) in the following years cannot be met sufficiently in regard to economic and technological development".

In 1975 the same Association summarized a new projection as follows: "Presumably beginning with 1977/78 the growing numbers of enrolments for electrical engineering will bring about that the demand for electrical engineers is lower than the increased number of graduates. It must be feared that supply of electrical engineers until 1980 will exceed demand ... A further increase of university and college capacities therefore cannot be pleaded for ...".

In the same year the Battelle-Institute concluded its projection for natural scientists and engineers: "For all projection alternatives considered and for the whole projection period an excessive supply over demand is calculated ... In 1980 8 per cent, in 1990 even 33 per cent of all engineers will not find adequate job opportunities".

Then, in 1979, argumentation changed radically. The Handelsblatt: "The actual numbers for (enrolments at) technical universities and colleges show for 1979 an alarming decline in student enrolment numbers, described as a catastrophe for some universities. On the other hand, an increasing demand by industry for young engineers is observed".

And again in 1980 the Association of German Electrical Engineers": "Altogether and despite the uncertainty about future economic growth it can be expected that in the near future the need for electrical engineers will be higher than in 1970-1975".

In the meantime, the interpretation of the labour market situation began to turn around once more. In 1982 the German Science Council (Wissenschaftsrat) recommended caution concerning forecasts about a lack for engineers; a steadiness of enrolment and student numbers in these faculties should be achieved. The Association of German College Engineers even had fears of excessive graduate numbers compared to employment possibilities and warned students to enrol for engineering.

These examples illustrate the ups and downs of forecasts arguing mostly in medium terms but having far reaching effects on educational and labour market developments. Reactions on students' decisions take place very rapidly (enforced by the missing alternatives regarding the worsening labour market situation for graduates of other faculties) and thus create unforeseen cobweb cycles.

The second problem, why lamentations about a serious lack of engineers during the second part of the seventies became so numerous, might be seen at first in a demand suppressed in the wake of the economic recession of 1974. Many enterprises had cut down their research and development activities, but were encouraged by the economic upswing in 1977-80 and forced by the growing technological competition with other countries to invest more in research and in highly qualified technicians. Also, the technological change was assumed to be met only by a freshening-up of the stock of engineers. Older technical personnel (not only at university and college-level) were being replaced by new graduates who are believed to have new qualifications in order to cope with future requirements, especially with microelectronics. Besides, income and career expectations being lower than in former years also facilitated this renewal of engineering stock under the aspect of cost reduction.

The comparison of projections of qualification and labour market structures, especially for highly qualified manpower, to actual development shows -- we might conclude -- that the basic factors of supply and demand were predicted with reasonable accuracy. This refers mainly to the economic components of the projection models. It should be added, however, that those parameters on a highly aggregated level remain relatively stable in the medium-term.

On the contrary, predicted fine-structures of educational and employment developments show, on the whole, rather serious discrepancies compared to reality. The growth in the number of entrants to universities and colleges and in student numbers had not been foreseen, attributed to "wrong" estimations of the sensibility of educational attainment behaviour on the labour market situation and on the situation predicted by the forecasts themselves (self-destroying prophecy). These anticipations of educational decisions apparently led to cyclical movements on the labour market.

The built-in tendencies of over - or under-modulation, in view of a market behaviour of people and enterprises not centrally planable, are the main reasons for warnings about an uncritical use of projections. In addition, only first steps have been made as yet to take into account elasticity and sensibility processes of the labour market system. Worth mentioning are calculations of mobility and substitution margins and approaches to estimate the degree of projection's sensibility to variations of model parameters. Still much work has to be done in order to include wage and price mechanisms, institutional components, and the influence of market and bargaining power on labour market interactions.

For the above reasons opinion prevails nowadays that highly disaggregated projections (e.g. for special university disciplines) are but one out of many guidelines for educational and labour market policy decisions. For individual guidance they even have next to no importance. Public policy and research institutions have become aware of the insufficiency of projections.

5. Conclusions

What are the conclusions for future forecasting activities given the background of the above-mentioned labour market crisis ? There are indications that the impact of demographic and educational expansion in the last two decades on the labour market and employment situation of the next 10-15 years can be predicted in general terms with fair accuracy. The same can be expected for the long-term change of sectoral shares in the economy and for the rising overall qualification of the labour force.

Expectations of technological impacts on the labour market, and about the labour market and educational behaviour of individuals, seem to be relatively open (soft). Also, political/legal/institutional measures taken (e.g. concerning working time adjustments, employment and economic programms, and foreign worker policy) can hardly be foreseen.

The structure and the number of jobs available will change more rapidly than ever before due to the far-reaching technological and social change expected. This development could already be seen in the Federal Republic of Germany, as in most other industrialized countries. All these countries seem to follow a similar pattern of development with decreasing labour force share of the agricultural sector and increasing share of service sectors.

The qualification structure of the labour force in the Federal Republic of Germany, which is statistically available only for the past decade, shows - despite statistical problems of comparison - a considerable growth of HQM-share (6 per cent) and a diminishing one of lower qualified manpower (25 per cent in 1980). This process of rising qualification of the labour force is expected to continue in the next years when an increasing number of university graduates will enter the labour market. This will worsen their employment chances at least for this period. The segmentation of the labour market observed in the last years is expected to continue in the future : On the one hand, low qualified workers with unemployment rates more than twice as high as those for skilled manpower. On the other hand, for all types of skilled labour (vocational training, technical training, short and long term university training) a levelling of specific unemployment rates is observed.

New university graduates nowadays do not have significant privileges on the labour market as in the past. But the chance to obtain interesting jobs and to move up the career ladder becomes increasingly dependent on the skill-level achieved. Formal qualification alone is no longer sufficient, but more and more a condition sine qua non.

There are many indicators to confirm the assumption that the negative consequences of demographic fluctuations on motivation, innovation and adjustment capability of people might be compensated by better and longer training. The dangers of "overqualification", in the sense of provisional training, are supposed to be less important (and cheaper for the social system) in the long run than omissions in educational and training policy now. More than ever it seems necessary to base policy on long-term considerations, instead of being paralysed by the pessimistic prospects for the crucial decade before us.

C. SOME MANIFESTATIONS AND IMPLICATIONS OF UNDER-EMPLOYMENT OF COLLEGE GRADUATES: THE CASE OF THE FEDERAL REPUBLIC OF GERMANY

by Dirk Hartung

There are many manifestations of underemployment of college graduates: unemployment itself, forced part-time work, and "inadequate" work compared with the level and quality of education.

The contribution by M. Tessaring in this chapter gives an overview of the situation and the trends of the academic labour market in the Federal Republic of Germany. I will try to describe some implications of underemployment especially the problem of mismatch between qualifications and jobs performed.

What we will discuss here deals with the so-called "mismatch" between quantities and qualities of graduates and jobs. First, let us focus on quantitative aspects of the imbalance between the number of graduates and the number of jobs offered in the institutionalized (or formal) occupational system, be it the private or the public sector. Unemployment is no doubt a "hard" indicator for that mismatch, but unfortunately official statistics are no hard indicator for unemployment at all. The official statistics of labour market authorities showed about 30,000 unemployed graduates of universities and Fachhochschulen in 1983, which means an unemployment rate for this group of 3.5 per cent. These figures do not however reveal the total unemployment.

There are many college-degree holders who are not unemployed in statistical terms and by legal definitions, but who do not have regular work contracts and do not appear in the occupational statistics (of public service, private industry or regular self-employment). It is frustrating for a researcher to know that there are persons without any definite status, and not be able to quantitatively determine the nature and extent of the problem. On the basis of estimates made by Tessaring[1], one may assume that this dubious status holds true for about 20 per cent of recent graduates in 1978 -- even more at present -- especially in the fields of teacher training and social sciences. This group is referred to as the "unexplained rest".

To this impressively large group we might add those students still being enrolled but not actually studying. Most of them are working in some way, but many are not regularly employed and do not appear on the official labour market. Naturally, exact information on their numbers is not available, but there are so-called "informed guesses" of about 150,000 "dead souls"[2] (p. 402). Data of the Freie Universität Berlin support these estimates: about one fifth or the students -- even degree holders -- are enrolled, but not attending lectures, seminars, etc.

There are reasons for enrolling but not studying: to secure certain student privileges, social security, cheaper transport, etc. But the main reason is that they prefer to keep the identity of a student rather than that of being unemployed.

We consider, therefore, that this form of non-registered unemployment is more widespread and a more important social issue to be taken up by research than the officially registered graduate unemployment. We strongly believe that the officially registered unemployment is only "the peak of the iceberg", as one labour union leader stated.

Strangely enough, the registered and the non-registered graduates without work as well as the "old" students have one thing in common: they are all working in one way or another, and most of them are underemployed, if we use the traditional criteria for academic jobs. What are the kinds of jobs that they hold ? What are they doing ? The problem is discussed in the Federal Republic of Germany under the heading of a "grey zone" of employment. There are various types of employment conditions which might be discussed in this context ; new kinds of self-employment, partly in the so-called "alternative" scene ; various activities in an informal sector of "underground economy" or shadow economy including traditional "black work", or part-time jobs and combinations of part-time jobs (the official definition of unemployment in the Federal Republic of Germany is if a person works less than 20 hours per week) ; work in projects in various areas research and social activities ; fee-contracts for teaching in universities and institutions of adult education ; home work for other self-employed people, for example in architecture and computer programming, as a subcontractor of a subcontractor, etc. Most of these types of jobs do not entail regular working contracts and registration, and many are on the borderline of illegality. As a consequence, persons holding such jobs live under unstable working conditions and are badly paid. Another implication is that there is no control as regards working hours, intensity of work, place of work, etc., as compared with jobs in the official employment system.

---

[1] M. Tessaring, "Zum Verbleib der Hochschulabsolventen seit 1971", in Mitteilungen aus der Arbeitsmarkt - und Berufsforschung, Vol. No. 2, 1978, pp. 184-212. M. Tessaring, "Akademikerbeschäftigung im Wandel", in Das Arbeitskräfteangebot zwischen Markt und Plan, edited by H.P. Widmaier, Berlin: Duncker and Humblot, 1983, pp. [illegible]1-280.

[2] C. Schlegelmilch, "Grauer Arbeitsmarkt für Hochschulabsolventen", in Soziale Welt, Nos. 3/4, 1982, pp. 400-439, p. 402.

Although there are no representative surveys or valid data concerning this field, in the last two to three years a certain amount of research has been conducted, mostly in the form of small-scale regional studies and monographs[1].

While nearly 60 per cent of the graduates in political science and almost 80 per cent of the sociologists found jobs related somewhat to the content of their studies, only about 20 per cent had stable working conditions with regular contracts. Some of these jobs were so badly paid that, even having completed their studies, the graduates had to continue to live like students on scholarships. If we observe the cohorts, the situation is becoming worse as far as more recent graduates are concerned ; jobs are becoming less appropriate as far as both content and employment conditions are concerned. Given the above observations and views, two major questions might be raised which are relevant both for research and political debate:

1. What is the impact of this "reserve army" of officially unemployed graduates and those graduates working under unstable employment conditions in the regular labour force and the institutionalised arrangements (contracts, wages, control etc.) ?
2. Is it realistic to expect positive effects and influences from this hidden employment sector in terms of more flexible and sometimes more self-determined and useful work, which in turn stimulates similar changes in the structures and job-content in the formal sector ?

In this context we might mention an on-going debate as regards new value orientations of graduates, shaped in universities and addressing the world of work. According to certain views, a growing number of graduates are not eager to take up traditional jobs and therefore are not forced into the informal sector only because of the lack of traditional jobs.

---

[1] Many of these studies are documented in F. Hegner and C. Schlegelmilch, Formen und Entwicklungschancen unkonventioneller Beschäftigungsinitiativen, Berlin, Wissenschaftszentrum Berlin, 1983.

Surveys on the so-called "grey-zone" focus on occupation and jobs in the "alternative" sector, characterized by self-organized projects, non-hierarchical work-relations and an orientation towards new products and services. Two kinds of work organization were identified as far as jobs of college graduates are concerned: alternative projects, mostly engaged in social services, trade, production and repairs, and the so-called "new self-employed" (Neue Selbständige). The latter differ from traditional forms of self-employment primarily in that they have not been specifically trained for the jobs they perform. In an overview on current research in this field, Hegner and Schlegelmilch estimate that in the Federal Republic of Germany there may be about 60,000 jobs of this type equivalent to remunerated full-time work. The percentage of college trained persons -- be they regular graduates, drop-outs or students -- in such jobs differs from field to field and region to region. One might estimate that the number of graduates amongst persons holding such jobs is about 40 per cent. A small number, but obviously extremely relevant for research and the actual political debate.

The rest of the grey zone seems to be larger in size. There are a considerable number of graduates from certain fields of study, especially teacher training and the social sciences, who are forced into inappropriate jobs. An example of a specific region and field of study: graduates in sociology and political science in West Berlin[1], a group on which we have some information. Amongst this group there are not only newly graduated persons in inappropriate jobs, but also graduates who had previously held stable jobs and were not forced to leave them. Many of the jobs and completely unrelated to university studies -- for example the famous taxi drivers.

These observations also concern another aspect of mismatch: the qualitative discrepancy between the educational level and the expectations of the graduates on the one hand, and the characteristics of the jobs offered in the formal employment sector on the other. Some years ago researchers and planners already feared that over-education would lead to totally inadequate positions for graduates in industry and public service due to educational inflation. That means: individual downgrading. In the meantime, surveys have been conducted that indicate only slight processes of down grading as regards the first employment, and nobody knows what will happen to the job holders' careers in the future.

---

[1] R. Ebbighausen, et al., Berliner Politologen und Soziologen auf dem Arbeitsmarkt, Berlin, 1982 (unpublished manuscript).

So we can speak of a mixture of "training robbery" (as Ivar Berg named the strategies of employers in the United States) in terms of absorption without using the level of qualifications and without adequate remuneration, and a gradual adaptation to the expectations and specific knowledge of the graduates in defining the jobs, shaping the division of labour and especially modifying the career ladders and promotion schemes. That means: occupational upgrading.

And now the main question for researchers, manpower and educational planners is to identify and to shape the conditions under which this process of smooth adaptation could continue. This means to use the so-called overqualification not to improve productivity -- which is not an important issue in the Federal Republic of Germany for the time being --, but to reshape working conditions. Almost all researchers share the view that this will not occur simply on the basis of labour market forces, even if assisted by strong labour unions (which are not at present in a strong position because of unemployment), but that there must be political action to achieve this.

In the Federal Republic of Germany there are concepts, ideas and instruments for planning and intervening in the educational system, less for the labour marked and almost none for the occupational system. That is the major difference between market-oriented and socialist countries, at least in theory -- I wonder whether this difference holds in practice as well. The changing conditions in the Federal Republic of Germany call for closer co-ordination of educational, labour marked and occupational policy.

D. CERTIFICATES AND RECRUITMENT

by Michael Buttgereit

1. Introduction

In 1981, a study[1] was conducted to find out which criteria might be important in recruiting young graduates from the universities and the Fachhochschulen (short-cycle higher education). In order to obtain the required information, interviews were conducted in nearly half of the 100 largest firms in the Federal Republic of Germany.

The main themes of the interviews were:

- the relative importance of different items of information to be selected from degree certificates, such as main subjects studied, kind of degree, grades, reputation of the educational institution attended, length of studies, professors' reputation, etc.,
- the validity of grades,
- the weight of information on candidates obtained from certificates against information to be gathered from their curriculum vitae and from interviews with them,
- the recruitment process itself and the role of different departments (personnel and other) within this process,
- changes in recruitment practices and criteria within the last ten years.

Other themes of importance pertained to long-term employment strategies, salaries of young graduates, trainee programmes, the place of the personnel department within a firm's hierarchy and its influence on long-term strategies of a firm, contacts with universities and Fachhochschulen, and personnel statistics.

---

[1] M. Buttgereit, R. Holtkamp, U. Teichler, "Zum Bedeutungswandel von Hochschulzertifikaten", in: Zeitschrift für Sozialisationsforschung und Erziehungssoziologie, Vol. 1, 1981.

Now, why is it important to study recruitment processes and the strategies and criteria governing them ? Why stress the functions of certificates, and why study the recruitment of higher education graduates in large private firms ? In a short paper like this, only rather summary answers to these questions can be given. However, this may suffice to give an impression of the framework within which it was felt useful to make this kind of study.

First, it is not considered that there is a direct and immediate relationship between a field of study and a job in a work environment outside an educational establishment, between a situation of organized learning and of organized work, or between the knowledge and skills a student acquires at school or university and the qualificatory demands he has to meet when employed. Rather, there are various "mechanisms" of mediation in this relationship. Recruitment activities comprise one of the most important sets of mechanisms of mediation and so constitute a fruitful field of socio-economic and sociological research on the inter-relations between education and employment.

Second, on a very general level, certificates can be viewed as a means of information characterizing a person's qualifications acquired in one societal setting for use in another, thereby functioning as an informational link between those two settings. However much the prognostic validity of certificates is questioned, whatever critics of "credentialism" may have to say about possible detrimental effects of the allocation of people to positions on the basis of their acquired certificates, and however doubtfully certificates are regarded by employers, they still exert a powerful influence on recruitment decisions - at least as to whether or not it seems worthwhile having a closer look at certain candidates. It is known, of course, that the information provided by certificates is of utmost importance for recruitment to the civil service in the Federal Republic of Germany, as well as in many other countries. In the first place certificates represent an easily available information-base in the recruitment process. Even if employers do not expect perfect validity of the information obtained from certificates, they still might utilize this means in the absence of alternative information.

Certificates are symbolic products of a structurally differentiated system of education, thereby serving other societal systems and agencies and, at the same time, stressing the relative autonomy of the education system. Therefore, research on how information conveyed by certificates is evaluated and handled in the course of recruitment is of considerable value in assessing some of the inter-relations between education and employment.

Third, this study of recruitment activities focussed on the private sector of the economy for various reasons:

(a) When it comes to the employment of graduates more variation is to be expected in the private than in the public sector, which means that we may also expect notable differences in the handling and evaluation of certificates. This variation is an important prerequisite for analysis insofar as it allows the dynamics of recruitment to be studied under the impact of different organizational conditions, artificially held at bay in the public sector.

(b) The absorptive capacities of the public sector seem to become more and more reduced each year - both because of a high intake of graduates in the last fifteen years, producing a highly skewed age-grade distribution amongst those employed in the public sector, and because of the continuing economic stagnation. In this situation it is quite obvious that many people are curious about whether the absorption of graduates of higher education in the private sector could be enhanced.

(c) In the Federal Republic of Germany, the percentage of graduates of higher education in the total labour force has risen from 5.7 per cent in 1970 to 8.5 per cent in 1980[1]. As this ratio is still rising it is important to know whether the "academization" has already had some impact on the division of labour in private firms. Have higher education graduates taken over positions previously reserved for non-college-trained employees, or is there a tendency towards levelling of organizational hierarchies due to an increasing share of graduates in the labour force? Questions such as these can be looked at in the study of recruitment processes and strategies.

It was decided to study recruitment processes and strategies in large firms since, however much recruitment frequencies will vary by branch, type of production and type of firm, it is here that recruitment of higher education graduates becomes a routine and everyday affair, carried out by personnel especially assigned to this kind of task.

What follows is a preliminary report on some of the main results of the research so far. After a short description of the sample and some recruitment statistics, there follows a short summary concerning the weight placed on grades, the individual educational establishment from which applicants have graduated, and time spent on studies. Further, changes in recruitment criteria and career outlooks for graduates are dwelt on in some detail.

---

[1] See W. Clement, et al. "Zur Entwicklung der einkommensspezifischen Einkommensrelationen in der Bundesrepublik Deutschland" Mitteilungen aus der Arbeitsmarkt- und Berufsforschung 1980; Vol XIII, p.195; Bundesminister für Bildung and Wissenschaft Grund-und Strukturdaten 1982/83, Bonn, 1982, p.237.

Table 1. Distribution of Cases by Sectors and Branches

Manufacturing	
Chemicals (petrol refineries included)	9
Electrical engineering and electronics	6
Automobiles	5
Mechanical engineering	4
Aeroplane and space industries	4
Steel industries	2
Metal accessories (for automobiles etc.)	2
Food industries	2
Services	
Large commerce	2
Banking	4
Insurance	1
Transportation	1
Raw materials, energy	
Coal and ores	3
Electrical energy	1
Construction industry	1
	47

2. On the relevance of grades, the individual educational establishment, and length of studies as recruitment criteria

In the interviews with personnel managers, grades and grading held a prominent place. If certificates were deemed important at all, it was grades that were mentioned most often as one of the outstanding characteristics. This parallels the intended relevance of grades as selection signals from higher education.

Grades were considered by all the enterprises in the survey to give more or less important information on candidates, at least in the recruitment of graduates coming directly from establishments of higher education. The practical relevance of grades seems to vary, though: in only 60 per cent of the cases were they considered very important or important for employment selection.

Grades seem to acquire their greatest importance in certain phases of the recruitment process. If one looks at recruitment processes as having three phases:

- the formulation and announcement of a position and the required skills,
- the pre-selection phase, when possible candidates will be selected from the totality of the applicants,
- the final selection,

it is in the second phase that grades will have the most weight.

Especially where there are a large number of applications, the grades obtained will serve as a means to eliminate those candidates who will not be considered in the second round.

Relatively poor grades may be outweighed by special features of an applicant's curriculum vitae, such as occupational experience in related fields prior to studies. Also, it is interesting to note that there is rarely any wholehearted and uncritical acceptance of grades and of grading.

The educational establishment

It is a long tradition in the Federal Republic of Germany that universities should not be distinguished by rank as in many other countries. In principle, all universities (or Fachhochschulen) are considered equal in standard. What counts instead is the renown of professors and, nowadays, the existence of special equipment, laboratories and libraries for one or several subjects. What could be really important at present is the distinction between the new and the old universities. Partly because they are new, some universities are hardly known to personnel managers. Furthermore, the setting up of the new universities, especially those established in or since 1970, is closely linked with reforms to higher education that were considered dubious in business circles - this was reflected in the label of "red" attached to some of the new universities. Reality may be much more complex - or much simpler though, so it may be useful to ask first whether graduation from a certain university is of any substantial importance in recruitment at all?

It was found in only seven cases that the individual university was thought to be important, whereas in 14 cases personnel managers were either against selection on this basis or simply did not attach importance to where applicants had graduated from. In most cases, the name of the university or Fachhochschule was of marginal importance only. Interestingly enough, political reasons, whether in a positive or in a negative sense, were mentioned quite seldom ; instead, much more reference was made to the importance of certain educational establishments because of their outstanding specialization in certain subjects (for the aero-space industries, for example) or because of regular contacts for research, development, consultation and other activities with certain professors. In all, preferences, or vice-versa, for certain educational establishments stem more from practical than ideological reasons. The cognitive model underlying these judgements is not of an ordinal scale, but of a double dichotomy: There is a large class of acceptable institutions on the one hand and a small class of either positive or negative exceptions, but no rank order. (Although one could produce a rank order by asking personnel managers to rank universities on the one hand and Fachhochschulen on the other, this method of producing results was thought rather questionable, i.e. artificial. One can "measure" only if one knows the "metrics" used by the people you want to question. This kind of ranking would not provide any hints on recruitment practices, but might be of doubtful use in political debates on "what business wants from higher education".)

Length of studies

To take the number of semesters or years of study as a criterion for recruitment may be unique to the employment system of the Federal Republic of Germany. It stems directly from the fact that the universities do not have a prescribed length of studies, only prescribed minimum periods. This is one of the important contrasts between the universities and the Fachhochschulen, since for the latter study duration ranges between seven and eight semesters depending on the subject studied. Still, there may be norms, more or less informal, concerning an acceptable period of studies (lapses of time for interim work, protracted journeys and recovery from illness included), when the number of semesters can show signs of lack or seriousness or concentration or even personal disorganization. It is quite obvious that employers do not want to hire graduates who give the impression that they have not studied efficiently, but this does not mean necessarily that preference will be given to graduates who have finished their studies within the prescribed minimum period (eight or nine semesters). Rather one has to take into consideration the traditional pattern of studies at German universities, which allowed for one, two or even more semesters being given up to travel, change of university, or minor personal crises. Behind this was a concept that has lost momentum but nevertheless is still existent, whereby the university years were a period of personal education, growth and maturity. Following this cultural model, a minimum period of studies would be a sure sign of narrow-mindedness or even arrested growth, and employers do not want to hire graduates who have not reached an acceptable stage of personal autonomy. More down-to-earth is the view that for many subjects the minimum time of study has become completely unrealistic. So employers will look for the average time period needed, which may vary slightly according to the university in question.

Our interviews show that, except for a few cases where a short period of studies was valued very positively, most of the personnel managers in our sample for one reason or another took a liberal view on the number of years of study, provided applicants could show that they knew how to spend their time and to what end. As positive reasons for prolonged studies, the following were mentioned:

- broad frame of studies and the acquisition of additional qualifications,
- stay in a foreign country,
- work experience,
- participation in university self-government,

and as acceptable reasons:

- change of subject or university,
- family events,
- illness.

3. Changes in recruitment criteria

The last 10 or 15 years have seen rapid economic and technical change in many fields that have affected on the one hand terms of trade and markets, and business organizations on the other. World-market dependency of the economy of the Federal Republic of Germany has been growing and so has the need to keep abreast technologically with other leading industrial countries. It would be surprising if these changes had not had any impact on structuring the demand for higher education graduates, resulting eventually in rising qualificatory needs and/or in an overall increase of graduate employment relative to total employment.

The last 15 years have also seen sweeping cultural changes in the content of far-reaching politico-cultural movements. The universities, or at least their students and the younger staff, were deeply involved in these movements.

Last but not least, there has been a large-scale expansion of secondary and higher education, and the number of students is still growing. It can be said without overstatement that the line has been crossed toward mass higher education, which means a qualitative change in the development of this sector of education and - eventually - of the total labour force[1].

---

[1] About 20 per cent of the corresponding age-group is now going to university or Fachhochschule; this ratio is expected to rise to 35 per cent in the eighties and nineties. So far the effect on the labour force has been rather limited: between 1970 and 1980 the ratio of higher education graduates rose from 5.3 per cent to 8.5 per cent.

These socio-cultural changes may well have influenced graduates recruitment and employment too. First, employers may have been somewhat on their guard against potentially destabilizing behaviour of graduates, while at the same time waiting to utilize their underlying innovative spirit. Therefore, selection procedures must have become more finely tuned. Second, with rising numbers of graduates the labour markets have become buyers' markets, that is more employers are able at present to choose among larger numbers of applicants, except for some subjects (e.g. engineering, until recently). This situation will continue for quite a long time and, looked at from the point of view of the graduates, will become worse.

It is quite plausible that in such a situation employers' demands for certain qualifications will rise, sometimes even to unrealistic heights, as concerns professional beginners. Further, questions about the value of a certificate of higher education will be posed: If there are many seemingly good applicants, making choice on the basis of certified information difficult, employers will look for other information. They may enquire about occupational experience prior to enrolment, periods of practical work while studying, additional qualifications acquired (like computer programming, foreign languages, etc.), or they may show interest in spouses' occupations - being married to a teacher, for example, means the candidate may not be as mobile as desired.

To get some insight on changes in recruitment criteria and on their possible causes, the firms in the sample were asked whether there had been any changes in the last ten years or so. Sometimes these changes may have been perceptible on hindsight only, but mostly changes in criteria seem to be the result of personnel strategy in the light of changed market conditions, new qualifications needs, or the awareness of shortcomings on the part of new graduates.

It was possible to discern two types of changes in procedures and criteria for recruitment of graduates: (a) there is a tendency to react to purported shortcomings of graduates coupled with quantitative deficits in the labour markets for certain specializations ; (b) there is a trend towards increased demand for highly-skilled manpower. These two tendencies are illustrated below.

An example of reaction to shortcomings of new graduates is a growing emphasis on geographical mobility. Graduates it is said, are not eager to leave the town or region where they have lived and studied ; also that they reject some of the large agglomerations because of high rents and a comparatively low overall quality of living.

> "To move to X is often refused categorically. "By no means to X." This has been different in earlier years." (case No. 10);
>
> "Mobility has become more crucial because the readiness to be mobile has abated. This may be due to changing conditions at the universities. People have become more settled and it is only seldom that they change their university." (case No. 39)

It is in this context that a wife's occupation as a teacher (which is quite an attractive and economically stable profession in the Federal Republic) is looked at as a "brake to mobility", because teachers can neither move easily during the school-year nor beyond the boundaries of one Land.

Given the present labour market situation, it may seem surprising that graduates should turn down job offers. Although this may be a phenomenon that will have largely disappeared within the next few years , nevertheless there were eight firms that thought it advisable to put emphasis on geographical mobility as a recruitment criterion.

In some cases personnel managers also found it necessary to stress personal initiative and autonomy because they perceived shortcomings on the part of graduates:

> "The probing into personal autonomy and initiative didn't stand out so prominently in the past. You could take for granted that a graduate with a good certificate had these abilities." (case No. 19)

These and other personality characteristics were mentioned frequently with regard to changing requirements.

Within the last ten years or so it seems that skill requirements have changed most markedly in those firms that hire graduates to eventually become managers. There has been a marked tendency towards appreciation of cognitive flexibility, personal autonomy, communicative competences and leadership abilities:

> "Today, we look more for flexibility, because the technical change and changes in corresponding tasks have become very fast." (case No.43)
>
> "Employees have become emancipated. Authoritarian behaviour of managers is no longer possible ... Abilities for differentiated thinking and action have therefore become more important." (case No. 50)
>
> "Leadership has become much more important than in the past. My impression is that the emancipation of employees gives managers completely different challenges ..." (case No. 33)

The increased emphasis on personality characteristics has quite a lot to do with the cultural and political development mentioned above. Furthermore, this is in part a consequence of increased legislation concerning management labour relations, for one of the firms' responses to these challenges has been the promotion of personnel departments to full representation at boards of management. Subsequently, personnel departments have been acting somewhat as change agents that take into account external changes in the best interest of general personnel strategies:

> "Personality aspects have become more important as well because the personnel department has gained more power relative to other departments; it has become clear to them that the personnel department is capable of assessing applicants on these important aspects." (case No. 53)

Growing concern about personality characteristics does not automatically imply less concern about "classical" aspects of requirements, based on field of study and professional practice. When, however, organized work is considered to be an important societal force that has to be dealt with in a competent manner, this insight leads to changing requirements as regards graduates of higher education institutions.

Apart from the personality characteristics discussed above, there has been a rising demand for skills such as foreign languages and experience abroad, though this latter seems to be less marked as firms tend to send recruited graduates to special courses and trainee programmes in order to prepare them for their assignments.

The reasons given for these and other changes in criteria were most often technical and organizational changes on the one hand and changing relations in the labour market for higher education graduates on the other, followed by changes in the system of higher education and broader socio-cultural changes like the ones mentioned above.

4. Employment and career outlooks for graduates

This section will focus on two questions:

- does there exist any direct competition between graduates and persons having completed vocational education ?
- is it worthwhile for students to have a longer period of study at a university instead of going to a Fachhochschule as far as returns salary and career prospects are concerned?

Both questions are directed towards the rewards of higher education certificates.

Graduates in the organizational division of labour

Apart from three firms, near to perfect segmentation was found between graduates of higher education institutions, and people having completed vocational education. The firms in question were two banks and one large wholesale trader ; they wished to keep open at least some positions for their more promising apprentices. It must be borne in mind, however, that these apprentices have completed academic secondary education (Abitur) but have chosen apprenticeship instead of going to university; enterprises need to offer them traineeships after completion of their apprenticeship and then managerial positions, partly in order to avoid their transfer to universities. This kind of competition affects graduates in business administration and economics only.

If we look at the manufacturing firms and practically all the firms outside the service sector, we can see that requirements grew in departments such as research and development, construction and industrial engineering and in sales as well ; therefore more graduates are employed instead of technicians or skilled labour. This is not an instance of "displacement", i.e. a reaction of the part of employers to profit from an abundant supply of engineers and scientists, for there had not been an oversupply before 1980, and,strictly speaking, there is none today. What has happened is a marked reaction on the part of employers in order to cope with rapid technological change and the ensuing international competition. As one personnel manager of a computer firm put it, even in technical assistance to sales what had been screwdriver-based maintenance now far more resembles engineering tasks.

> "On the whole, the number of skilled labourers and related personnel is decreasing while the number of white-collar personnel is growing, and the number of graduates from the Fachhochschulen and the universities is growing faster than average." (case No. 51)

Considering the growing numbers of graduates together with the rising requirements due to technical and organizational change, these two movements explain to a great extent the rising percentages of graduates in the firms' total labour force. Under these circumstances, it seems highly unlikely that other occupational groups would compete successfully with graduates of higher education institutions.

Personnel managers were unanimous concerning whether they would recruit graduates for jobs that did not need their level of qualification. They would not do so as long as suitable persons were available to fill those jobs ; they fear discontent and low achievement on the part of graduates thus employed.

> "It does not lead anywhere to employ graduates in positions where they cannot utilize their qualifications properly ; it leads to dissatisfaction and low output." (case No. 50)

This remark illustrates the segmentation between graduates and those persons having acquired various vocational skills, and at the same time it indicates limited growth of graduate employment as long as there are sufficient people to occupy positions according to established patterns of division of labour. In any case it is doubtful whether the private sector will be capable of absorbing rising numbers of new graduates in the years to come and so change roles with the public sector as far as graduate employment is concerned.

Employment outlooks for different groups of graduates

At a time of high supply of graduates, it may be profitable for only a small proportion of the university graduates to have been enrolled at these institutions rather than at Fachhochschulen. It may be necessary to achieve the higher degree in order to compete for the more interesting and promising positions and careers, but as there are relatively few openings, recruitment decisions might be taken on other grounds. The large majority of the university graduates would have to compete with graduates of the Fachhochschulen or would have to accept jobs not related to their qualifications, if there were a marked segmentation in employment of the two groups of graduates due to largely differing qualification profiles.

In this context, the investigation focussed on possible differences in the employment conditions of the two groups of graduates, since there is neither massive misdirection nor massive unemployment of graduates from both groups, and indeed their unemployment rates are below average.

First, the main positions or tasks both groups of graduates are assigned to were looked at. In all firms but one, there were considerable differences in the job assignments to these two groups. However, the degree of overlap between the two groups does vary:

- in 20 firms, graduates of both groups have a set of core tasks (for example, R & D for university graduates, industrial engineering for the graduates from the Fachhochschulen), but apart from these there are similar job assignments for both groups.
- on the other hand, there were 22 firms in the sample that set quite strict limits against open competition between the two groups.
- In five cases, only one group of graduates - university graduates - were employed. Several reasons were given for this exclusive recruitment of university graduates: that the graduates

from the *Fachhochschulen* had lost their attraction because of curricular reforms de-emphasizing practical aspects of studies; that they would be less capable intellectually; that they are immature compared to university graduates, lacking personal autonomy and initiative. These may be extreme opinions, but they show that university graduates have a wider range of possibilities in the labour market than graduates from the *Fachhochschulen*.

Second, the starting salaries for graduates were analysed: of the 42 firms employing both types of graduates only two did not make any differentiation ; in all the other firms there was a difference in starting salaries for university graduates ranging from 6 per cent to 15 per cent. *Table 2* provides the absolute differences.

Table 2. *Advantage in starting salary for university graduates over graduates from the Fachhochschulen in large private firms*

no advantage	2
up to DM 3000,-	25
up to DM 4000,-	3
up to DM 5000,-	4
DM 6000,-, and over	8
	42

If one considers the longer period of study of university graduates and in certain fields their superior qualifications, their advantage in initial salaries is not very significant. On the other hand it would be short-sighted to measure financial pay-offs of educational investments only by starting salary. Graduates still have to prove their worth through their work performance and some aspects of their qualifications will only become apparent at medium- or long-term intervals.

This leads, *third*, to consideration of career prospects. According to information provided by personnel managers, it is the university graduates who have better chances to get ahead because the level of requirements in many firms has risen and therefore employment patterns have changed in favour of university graduates. Furthermore, university graduates often obtain their first positions in fields that are more apt to serve as a springboard for careers than do the graduates of the Fachhochschulen, and when there is direct competition between members of both groups it is often the university graduates who excel:

> "In principle, engineers from the Fachhochschulen and university engineers are interchangeable ; but the latter will more often move to managerial positions over time. Their intellectual stature is broader and they are more competent because of their education." (case No. 43)

Therefore, on the whole, it is still more advantageous to go to university as compared to going to Fachhochschule ; the differences in outcome between the two groups will be smaller, however, than the differences between all graduates on the one hand and vocationally trained persons on the other.

5. Summary

The results of this survey do not show that organizational hierarchies of private firms have been much influenced by the relative increase in the number of higher education graduates in the labour force, nor has there been a so called "displacement" of employees with different occupational education. There seems to have been a rising absorption of graduates in private firms, but this is due to rising requirements prompted by rapid technical change and increased international competition.

The results indicate that certificates do matter - both for the selection of candidates amongst applicants all having the same type of education, and for the demarcation between different groups in the total labour force. That is, there seems to be a certain correspondence between length and quality of education and the kind of positions for which graduates of different educational groups are recruited,despite on-going changes in recruitment criteria.

In fact, changes in recruitment criteria seem to favour the better educated groups of applicants or employees, as firms actively try to cope with increasing societal complexity and a more or less stagnating economy, and endeavour to recruit management personnel able to fill positions that have become more demanding.

Lastly, the results seem to show that - at least in the fields of study and employment sectors surveyed - that it is more advantageous to take up longer studies instead of going to a short-cycle institution, because initial employment and salary and, even more important, long-term career prospects seem to be better for university graduates in every field of study concerned.

Part III. Higher education and its relations to employment in the USSR and in the Federal Republic of Germany - a comparison

by Michael Buttgereit

CONTENTS

I. INTRODUCTION 233

II. THE DEVELOPMENT OF HIGHER EDUCATION IN THE USSR AND IN THE FEDERAL REPUBLIC OF GERMANY 236

III. HIGHER EDUCATION AND EMPLOYMENT 267

IV. SCOPE AND PROCEDURES OF EDUCATIONAL PLANNING IN THE TWO COUNTRIES 299

V. CONTINUITIES AND CHANGES IN HIGHER EDUCATION AND ITS RELATIONS TO EMPLOYMENT IN THE TWO COUNTRIES 313

A special word of thanks is reserved to Gabriele Gorzka; without her help I would have remained as illiterate in Russian as I had been all the time before.

M.B.

I. INTRODUCTION

Given the IIEP's perspective of aiding developing countries in their tasks of building up systems of higher education and planning suitable for these countries, it may be useful to compare systems of higher education and their interrelations with the employment system in countries whose roads to industrialization have been quite different; different solutions may be of equal value if considered in the perspective of a third country, and structural constraints as well as possible paths of educational development may be more easily apparent, if looked at in a comparative perspective.

This interest is parallel to the scientific interests of the researcher, who may hope to learn something on the functioning of systems of higher education and their place in different societies.

So, a comparison between the system of higher education and its relations to the employment system in the Soviet Union and in the Federal Republic of Germany is a challenging and rewarding task in both respects.

1. Aims and scope of comparison

In the literature on international comparative research in education[1] three aims are considered as basic to every comparative effort.

First, there is the aim of learning from another society and to see whether it would be useful and feasible to borrow or imitate some of its institutions and practices. This aim was prevalent in all comparative educational research in the early and later 19th century. This early research was conducted in an explicitly practical vein in order to introduce new systems of basic education or ameliorate old ones, either in the home societies of the researchers or in other societies where they acted as counsellors or colonial officials.

---

[1] See Holmes, B. Comparative Education, George Allen & Unwin Ltd., London 1981; Busch, A. et al. eds. Vergleichende Erziehungswissenschaft (Comparative Science of Education), Verlag Dokumentation Pullach 1974.

Second, there is the aim of establishing classifications of different educational phenomena over many countries, to supplement commonsense conceptions or an understanding that rests more or less unwittingly within the educational model of one nation.

The construction of classifications going beyond normative models is a continuous process, even after the initial success won by the international classifications now in use, because they can be useful only as long as they satisfy the needs of international politics and of social and educational theory. It is only with wide-ranging classifications that we can learn about the variability of educational or social phenomena.

The third and most ambitious aim of international comparative research is explanation. In fact, as experimentation in a strict sense is hardly possible in the social and educational sciences, the main path to explanation is through comparison on every level. So, if one wants to know more about one's own system of education one is bound to compare it with educational systems of other nations, because there is no internal variation as there is only one system. To be sure, partial analyses are possible within the system itself, but if one wants to analyse the impact of growing numbers of university graduates on the labour market, for example, or the impact of national planning on university curricula, one is bound to engage in international comparison. There are, on the other hand, themes for research that call for activities at an international level from the very beginning, such as, for example, the quest for causes of unequal development of national educational systems, for causes of different rates of dissemination of new knowledge within systems of higher education, or for the impact of major technological advances such as microprocessors on university curricula and on the links between higher education and employment.

Whereas in the first case one looks "upward", so to speak, in order to gain a transnational perspective, with suitable cases of comparison yet to be found, one looks "down" at a certain set or subset of countries suitable for comparison for one reason or another, in the second case. To do sound international comparative research one has to take both a transnational as well as a world-system perspective, however well- or ill-defined it may be at present.

Although the comparison between the Soviet Union and the Federal Republic of Germany is primarily to be seen as a transnational comparison, the world-system perspective is ever present in so far as each of the two countries has its rôle in intricate webs of international connections.

In so far as each of them represents a different social order competing for worldwide approval of their respective model of society, the world-perspective should prevail, but it would pre-suppose the establishment of an analytic framework in which each of the two countries would have to be positioned and compared on a multitude of dimensions, and that would be far beyond the possible scope of this study.

What is attempted here is a two-nation comparison in the field of higher education and employment, leaving out any world-wide or strategic ramifications.

2. Higher education in its relation to employment in the Soviet Union and in the Federal Republic of Germany: main topics of comparison

From the multitude of topics for a comparison of the two systems of higher education and their relations to employment a limited number have been selected that seem to be especially relevant for a description of the dynamic character of these relations in a middle-range perspective.

The first set of topics will be dealt with under the heading of the *development of the system of higher education* as a part of the general system of education. Two of them will be emphasized especially:

- the expansion of higher education;
- norms and realities of access to higher education over the years.

The second set of topics will come under the heading of *education and employment* and will comprise especially:

- the development of graduate employment,
- the rôle of actors external to higher education in changes of curriculum;
- labour markets for graduates of higher education;
- the place of highly qualified manpower in the division of labour.

Range and procedures of planning is the heading for the third set of topics chosen for comparison. We shall concentrate mainly on:

- scope and procedures of planning,
- changes in planning.

Owing to considerable gaps in the national statistics, the coverage of these topics will unfortunately vary in depth and richness of information, and there are difficulties due to differing categorizations. But this is to be expected in international comparison - the more so when one has to rely on materials that have been collected, most of the time, with other ends in view than to enable transnational comparability.

II. THE DEVELOPMENT OF HIGHER EDUCATION IN THE USSR AND IN THE FEDERAL REPUBLIC OF GERMANY

To compare two systems of higher education it is not enough just to consider them both in their present state; if possible one should take into account their paths of development as well, because some of their features can be much better understood when seen in historical perspective, and a comparison of development adds an important dimension to analysis. There are different time perspectives to be taken into account, though, because the Soviet Union was founded in 1917 and the Federal Republic of Germany in 1949; but this should not hinder the task of shedding additional light on each of the two systems, which have, of course their predecessors.

Most of the statistical data will be followed back to 1950, but some lines of development, especially for the Soviet Union, will be traced even further back. After a brief recapitulation of the main features of each educational system for reasons of orientation we shall look first at the expansion of higher education in both countries, including the financial aspects.

The second major concern of this chapter is the access to higher education. There are explicit norms defining the rights for access to higher education in both countries, and in both of them active measures are taken toward the realization of this right and to alleviate unfavourable circumstances working against it. Indeed, wide access to higher education is one of the means of cultural legitimation of the political system in the USSR and in the FRG, whatever its economic effects. It is another question whether they aspire to have higher education not only for great numbers of youngsters but for all; this implies a completely different political conception for higher education, in so far as the second alternative clearly demands equality of access more or less unrestricted by concerns of competence or excellence according to academic criteria. It is on the threshold to higher education that the interest in justice (i.e. higher education for everybody who wishes) will have to be weighed against the interest in competence (higher education for the able only) and the interest in flexibility according to economic circumstances (manpower requirements) as Burton R. Clark reminds us.[1]

1. Some of the main features of the two systems of higher education

(1) Both systems of higher education are public, and no fees are payable.
(2) The system of higher education in the Soviet Union is not differentiated vertically, in a formal sense, whereas that in the Federal Republic of Germany is; it consists of two tiers, one tier formed by the universities and similar institutions, the other by the Fachhochschulen, a college-like type of institution. The Fachhochschulen are in the lower tier of this system: the type of studies differs in that it is more restricted both in matters of time and curriculum, and the certificate is valued less than the certificate from a university.
(3) The two systems of higher education vary widely in horizontal differentiation; the system of higher education in the Soviet Union is composed of three types of institutions: specialized institutes (specializirovannye instituty), technical universities (polytechniceskie instituty) and universities (see Table 1). The specialized institutions are in the majority (more than 700 out of the total of 856 institutions in 1976).
This high degree of specialization seems to be an enduring aspect of Soviet higher education; more than 500 specialized institutes are still under the administrative tutelage of branch ministries; the all-union ministry for higher and specialized secondary education and its homologues in the Soviet republics are, in these cases, co-responsible only for curricular contents and teaching standards. The central ministry is directly responsible for the thirty biggest and most renowned universities in the Soviet Union only, and the rest are supervised by the ministries of the republics. An inspection body for controlling and regulating teaching methods and curricula has been attached to the central ministry and has become responsible for all establishments of higher education in the Soviet Union.
In the Federal Republic of Germany it is the universities which are the preponderant part of the higher education[2], even if their

---

[1] CLARK, B.R. The clash of national interests in higher education, in: Report of the Second International Seminar on Higher Education, Hiroshima University 1980; Hiroshima 1981; p.16ff.

[2] The theological seminaries, the Gesamthochschulen (comprehensive universities), Pädagogische Hochschulen and Kunsthochschulen, Sanyal and Teichler mention, are counted with the universities (Chapter 1 of Part II above).

BEST COPY AVAILABLE

Table 1. Higher education in the USSR by field of study, 1975

Industry and building construction	219
Transportation and communications	43
Law and economics	54
Agriculture and forestry	100
Public health and physical culture	102
Teacher training	283
including universities	(63)
Fine Arts, musics and cinema	55
	856

Source: Public Education, Science and Culture in the USSR. Statistical survey cl.1977. (Narodnoe Obrazovanie Nauka I Kultura V SSSR. Statistitcheski sbornik.)

number is smaller than the number of Fachhochschulen ("colleges"). In 1982 there were 56 universities, 9 comprehensive universities, 13 Pädagogische Hochschulen, 12 Theological seminaries and 26 Kunsthochschulen against 118 Fachhochschulen, but the Fachhochschulen had only 21% of the total number of students.[1]

The Fachhochschulen are short-cycle institutions, and their certification rules do not allow indefinite length of studies as is the case in the universities. The minimal length of studies is three and a half years at the Fachhochschulen and four and a half years at the universities.

There is a certain amount of self-government on the basis of budgetary independence through elected bodies and elected presidents of institutions of higher education in the Federal Republic. In the Soviet Union rectors are appointed by the ministry in charge, but deans and heads of departments and all teaching staff are elected by the Scientific Council.

In the Federal Republic institutions of higher education depend directly on the government of the Land (state) in which they are situated. The federal government has no direct authority over the system of higher education but it can influence higher-education policies of the ten Länder of the Republic through bargaining over subsidies, as the Länder are not able to finance investments in new buildings, etc., as well as providing for most of the running costs of establishments of higher education.

---

[1] Federal Ministry of Education and Science, ed. Grund-und Strukturdaten (Basic data on education) 1983/84, p.109, Bonn, 1983.

(4) A difference of vital importance for the functioning of the two systems can be seen in the amount of planning devoted to the running of higher education. Indeed the matching of higher education with the manpower needs for all national activities - economic, social, cultural etc. through central planning is a major feature of the administration of Soviet higher education. There exist planning bodies in the Federal Republic as well. But as the overall system of higher education is run in a decentralized manner and lacks features that would make it easily controllable - such as, for instance, consistent admission regulations - these planning bodies could never equal the importance of such a planning organization as the Soviet Gosplan, which is invested with executive powers. And while among "market economy" countries, the Federal Republic of Germany is the one where the largest number of manpower and general educational forecasts have been made, overall planning in the strict sense of the term is not a characteristic feature of the administration of higher education and its links with employment.

(5) There is quite a difference in the share each of the two systems of higher education has in the total amount of research being done. In the Soviet Union there are the various academies exclusively established for the conduct of research, with the Academy of Science at the top. Apart from graduate programmes their links with teaching and higher education seem to be tenuous. This is not to say that there are no regular research activities in institutions of higher education in the Soviet Union, of course, as every professor has to spend a third or half of his working time on research, but their proportion appears to be smaller than that of their opposite numbers in the Federal Republic.

2. The expansion of higher education after the second world war

The period from 1950 onwards has seen unprecendented growth of higher education in nearly every one of its features in many countries. This applies to the systems of higher education in the Soviet Union and the Federal Republic of Germany as well as has been amply documented already in the two country studies in this volume. In this section similarities and differences will be brought out and some information will be added on the situation of each of the two countries.

(a) Admissions, student numbers and graduations

Figure 1 shows that between 1955 and 1980 the number of new admissions to higher education rose by 2.3 times in the Soviet Union and by 3.3 times in the Federal Republic. The curves for student numbers differ (Figure 2) as well in that the development in the Federal Republic became faster from 1970 onwards and especially so in the period between 1970 and 1975. There are two reasons for these different developments. In the Soviet Union the reconstruction of higher education after the war began earlier; and the demographic developments in the two countries differ, i.e. the postwar "baby boom" came at least five years later in the Federal Republic than in the major countries of the Western world and in the Soviet Union.

In 1955 there were 461,000 new admissions in the Soviet Union, and more than 1 million in 1980; in the Federal Republic of Germany the number of students admitted yearly rose from 40,000 in 1955 to 132,000 in 1980[1]. Looking at the curves in Figure 1 the development of numbers of admissions shows much higher growth in the Federal Republic than in the Soviet Union over the whole period between 1955 and 1980, but this is due to the last ten years of this period. Another remarkable aspect is the hardly noticeable growth of admission numbers in the first ten years of the period in the Federal Republic as compared with the Soviet Union.

The difference in the rise of student numbers was even more pronounced than the rise in the number of new admissions in the Federal Republic, as is shown in Figure 5. This is largely due to the longer duration of university studies in the Federal Republic, caused in its turn by rather frequent changes of fields of study by the students, by overcrowding ("internal numerus clausus") and by individual time perspectives. There is no fixed length of studies in the FRG as there is in the USSR (4,5 or 6 years, according to field of study). Looking at the slope of the curves there is a parallel to the curves in Figure 1: in the first part of the period the number of Soviet students grew faster (till 1965); after this date the growth rate for the Federal Republic became higher. More than any other factor - population growth, for example - the cause of this rapid growth in student numbers (and, earlier, of new admissions) lies in the educational mobilization that was already in full stride by the second half of the fifties and, to date, is still increasing (see Section 3 of this chapter). Figures 3, 4 and 6 illustrate the size of the two systems of higher education in absolute numbers, to dispel the impression which might have been created by showing indexed growth rates only, namely that the development of higher education in the Federal Republic has been generally more dynamic than that in the Soviet Union. There can be no doubt that judged by all three indicators (number of new admissions, of graduates, and of students) the Soviet Union is still ahead. Its growth rates are smaller only because the development of its system of higher education started earlier after the end of World War II. These remarks do not

---

[1] The curves have been plotted on the basis of numbers given either in the country reports in this volume (Soviet Union; Tables 6 and 8 in Part I and the Federal Republic of Germany; Tables 4 and 5 in Chapter 1 of Part II) or from public statistics (Narodnoe chozjastvo 1980 g, Moscow 1981); Grund- und Strukturdaten 1974 till 1983/1984).

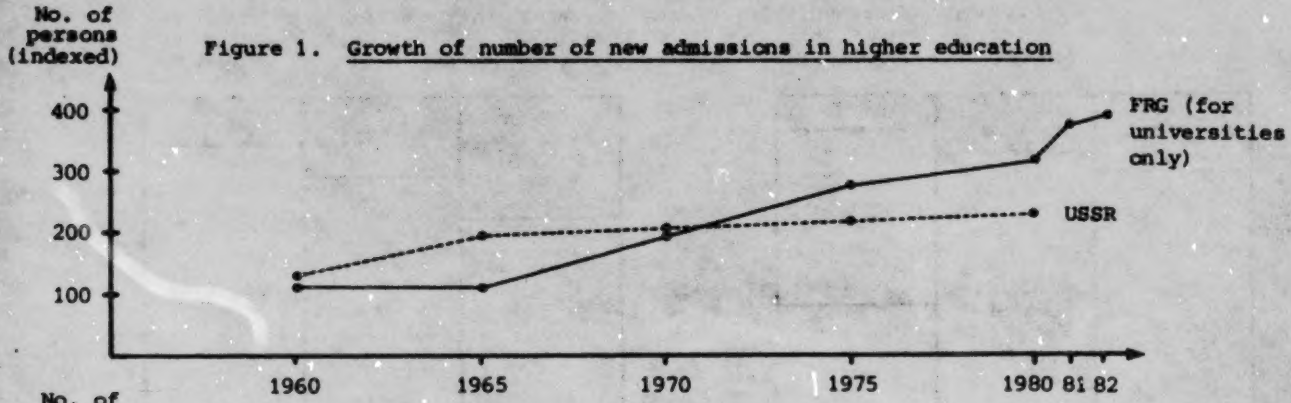


Figure 1. Growth of number of new admissions in higher education

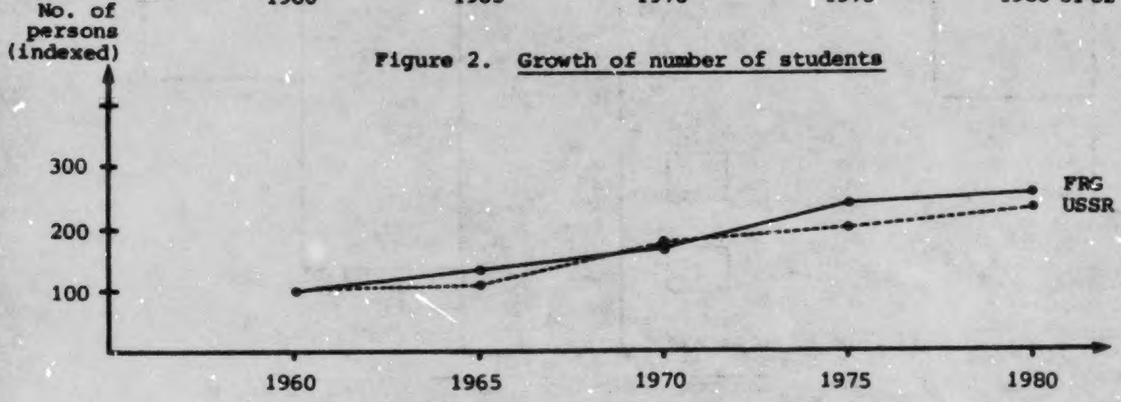


Figure 2. Growth of number of students

Sources: see Figures 3 and 4.

Figure 3. Number of new admissions in higher education

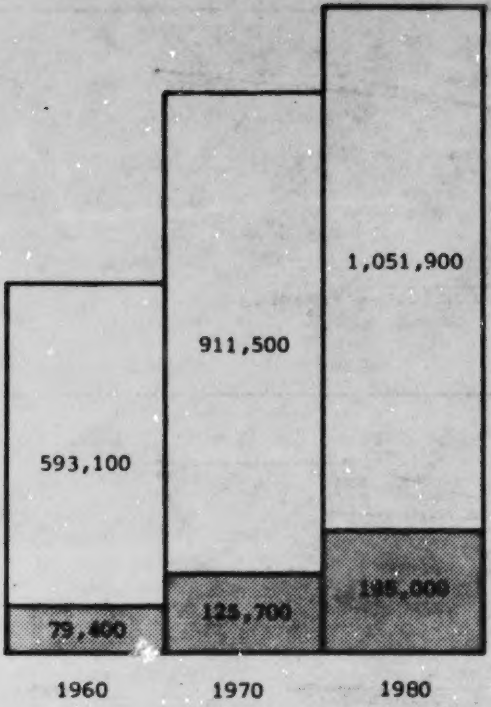
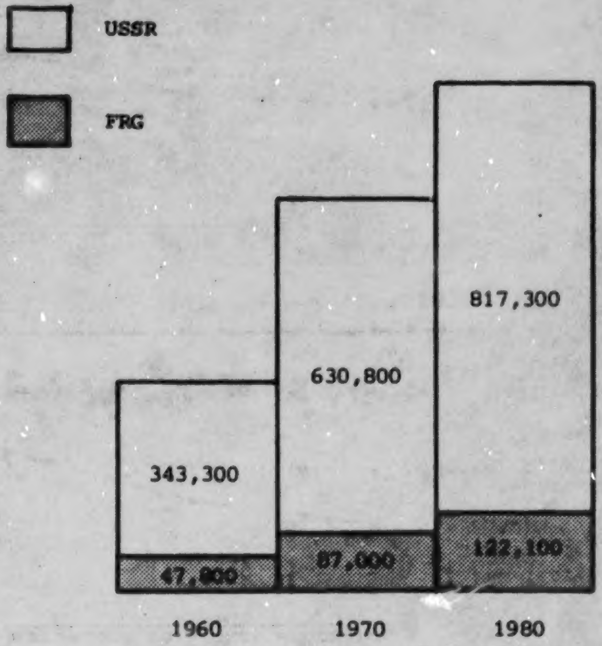
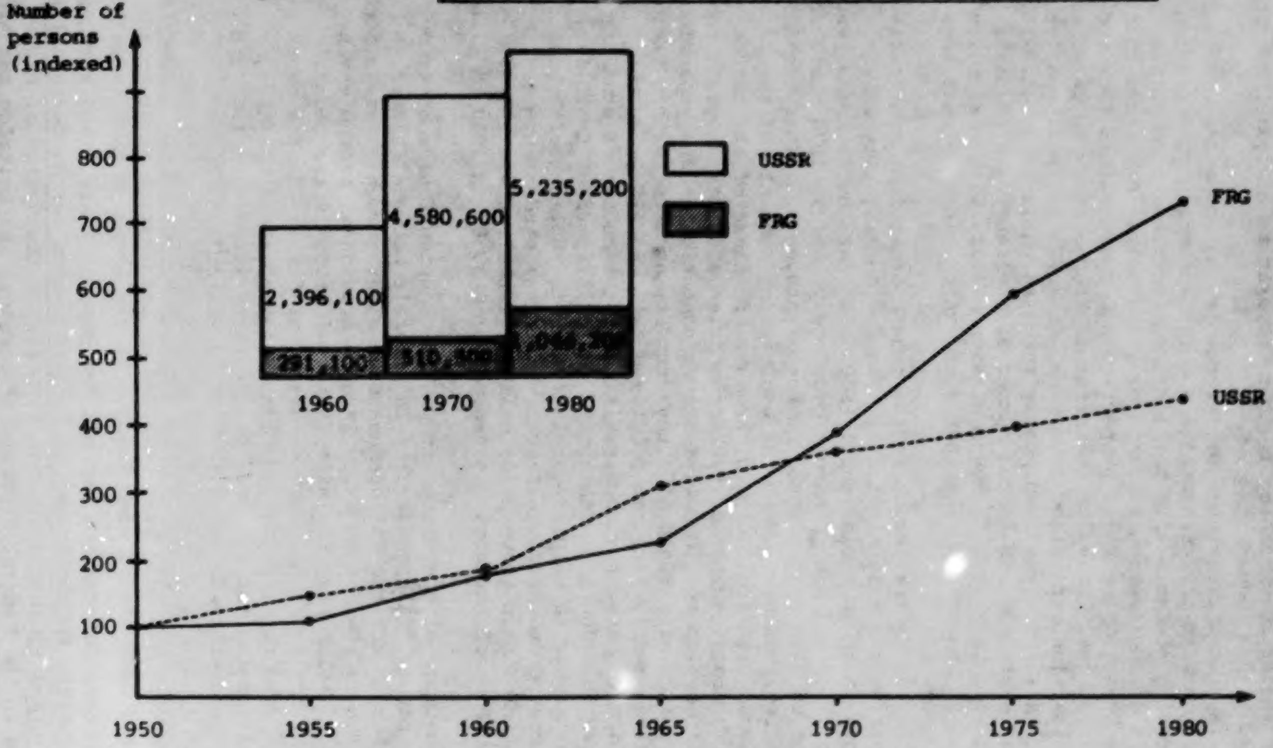


Figure 4. Number of higher education graduates



Sources: USSR report, Table 6(Annex) and Table 9(Annex); for the Federal Republic of Germany see Grund- & Strukturdaten (Basic data on education), 1981/1982, p.104 and 148.

Figures 5 & 6. Total number of students, indexed and in absolute terms



impair the approach chosen in this comparative analysis though if one bears this caveat in mind.

There is a most remarkable difference in the composition of student numbers between the two countries which appears when comparing engineering students with total student enrolment: computing the numbers of engineering students over the years[1] one finds that in the Soviet Union their proportion has risen within 15 years from 26,0% in 1950 (which seems rather high already compared with many other industrialized countries) to 45,7% in 1965. Afterwards, this share remained nearly the same until 1980 (44,9%). The impressive growth in the number of engineering students is illustrated in Figure 7, and contrasts heavily with the growth of student numbers in other subjects, which has been much less pronounced.

In the Federal Republic the growth of student numbers in engineering was a little faster than for the majority of the students in other fields until 1960. But for the next ten years numerical growth ceased almost completely, and in 1970 their share dropped to 9.8% of the total number of students. This trend is unaffected, moreover, when the engineering students of the Fachhochschulen are included, because the share of the latter among the total number of Fachhochschulen students dropped, too.

A newer development in Soviet higher education is the expansion of economics as a field of study: student numbers in this field have risen nearly nine times between 1950 and 1980, and the share of students of economics in the total number of students has more than doubled within this period (from 5.8% to 12.1%). Decreases have taken place, relatively, in public health, law, and - most pronouncedly - teacher training: student numbers in these fields have grown numerically, but their share in the total number of students has dropped from 39.8% in 1950 to 17.6% in 1980[1].

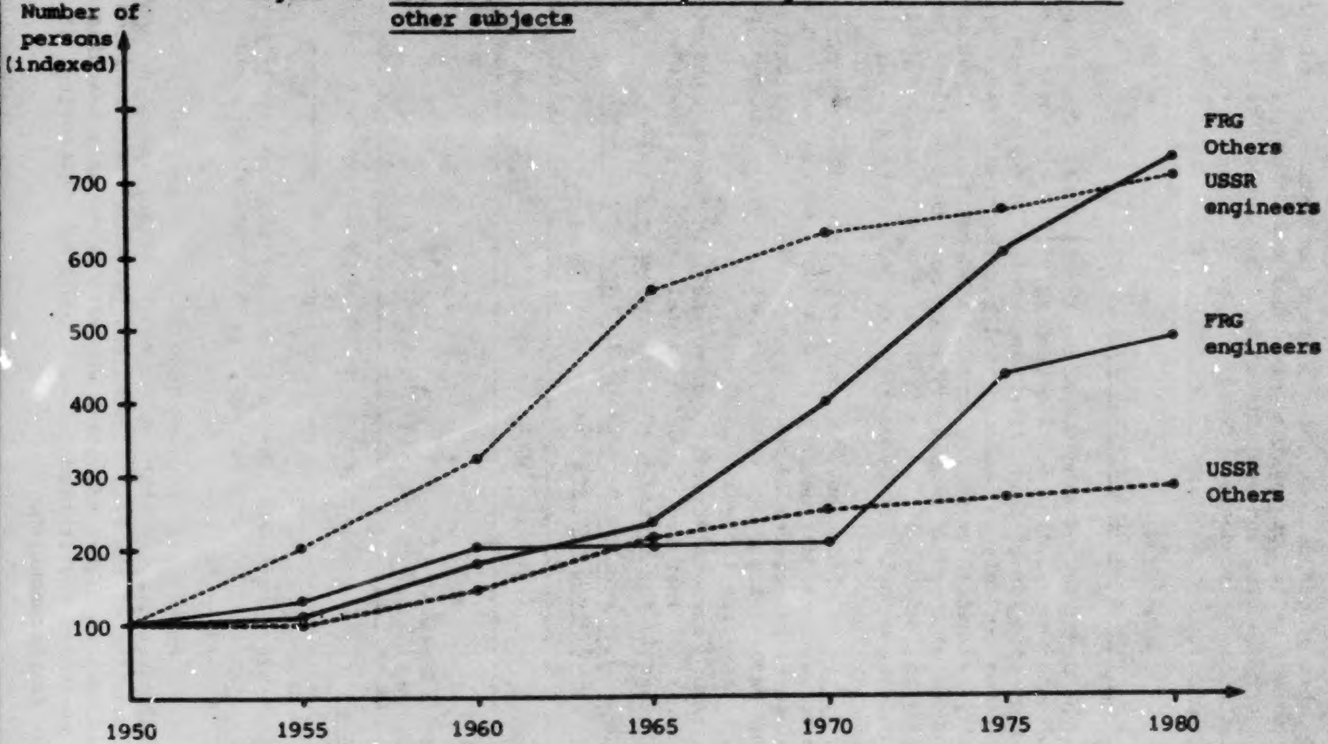
Because of the different way of grouping fields of study only a rather crude comparison is possible between the two countries. But the differences seem clear enough: whereas higher education in the Soviet Union largely gravitates around engineering of all sorts, the main fields of study in the Federal Republic are those that are relevant chiefly in the framework of the teaching profession, i.e. languages and the humanities, which accounted for 41% of all university student in 1970 and whose share of students in 1980 still was at 32%.[2]

---

[1] The percentages have been computed on information given in the original USSR report (see Table 8 in the Annex to that report).

[2] For further information see the FRG-report, Table 7 and BUTTGERETT, M. Quantitative Entwicklungen im Hochschulwesen der Bundesrepublik Deutschland (Quantitative Developments in the System of Higher Education in the Federal Republic of Germany) in: Beiträge zur Arbeitsmarkt - und Berufsforschung, No 77, Nürnberg 1983; p.21 ALBERT, W./ OEHLER, C. Materialien zur Entwicklung der Hochschulen, 1950 bis 1967, HIS GmbH, Hannover 1969 (Statistical Informations on the Development of Higher Education, 1950 to 1967).

Figure 7. Growth of number of engineering students and students of other subjects



The number of graduations shows a trend not unlike the number of new admissions in both systems of higher education (Figure 2), and their distribution over fields of study largely follows the distribution of students. This will be discussed more fully in Section III.

(b) Personnel in higher education

With the expansion of student numbers the essential functions of higher education could not have been fulfilled without a corresponding expansion of scientific personnel. Unfortunately the comparison can only go back to 1965, but the trend asserts itself clearly: within 14 years the number of scientific and pedagogic personnel employed in higher education more than doubled (from 222,000 in 1965 to 466,000 in 1978) in the Soviet Union, while in the Federal Republic of Germany it trebled (1966: 28,400, 1976: 76,700, 1980: 85,234)[1].

From Figure 8, which shows the number of scientific personnel together with student numbers (1965 = 100), we can see that this development has proceeded more regularly in the Soviet Union than in the Federal Republic, where most of this expansion took place within the first ten years[2].

With this growth in scientific personnel, in the USSR the student/teacher-ratio improved. Unfortunately this develoment was not paralleled in the Federal Republic, as Table 2 shows.

Table 2. Student/teacher ratio, USSR and the Federal Republic of Germany

	1965	1970	1975	1980
USSR	19	13	12	11
Federal Republic of Germany	12	11	14	18

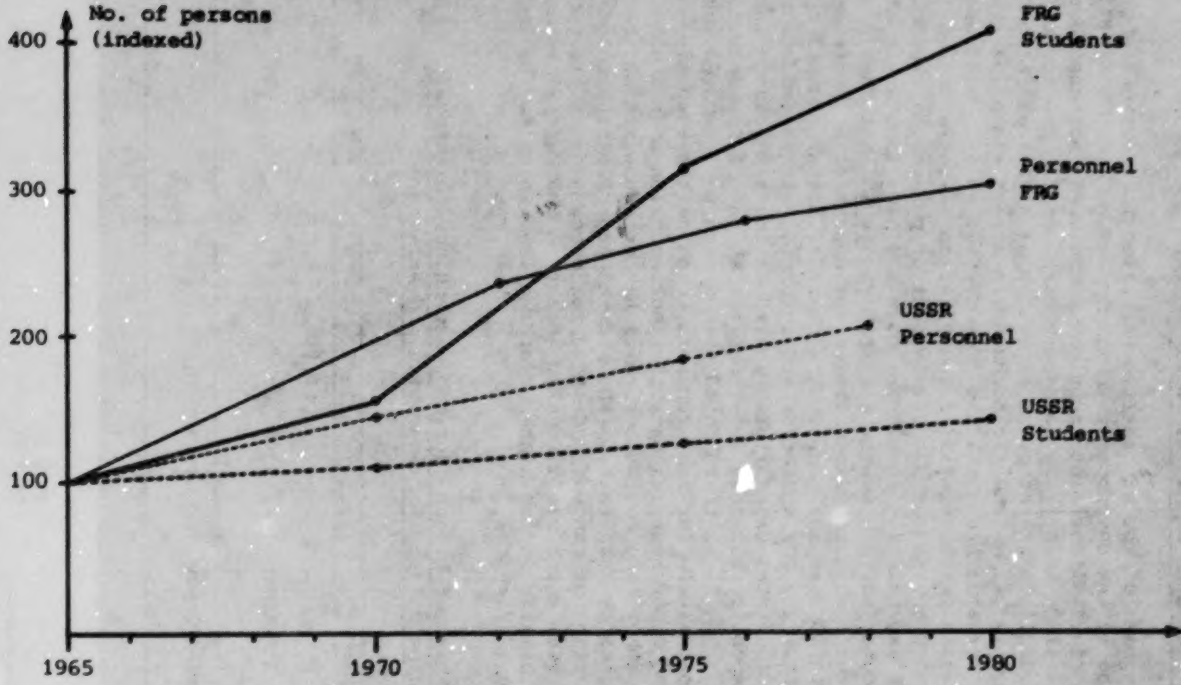
Sources: USSR country report, Table 34, Buttgereit, M. 1983, p.227

---

[1] See Table 33 of the USSR-report and for the FRG Grund- und Strukturdaten 1983/84; p. 164 (Basic Data on Education), and BUTTGEREIT, M. op.cit. 1983.

[2] Some of this growth between 1966 and 1972 seems to be due to administrative and statistical redefinition, though as with the foundation of the Fachhochschulen, personnel were included as teachers in higher education who were previously teaching at the fore-runner institutions (i.e. schools of engineering) of the Fachhochschulen.

Figure 8. Growth of number of scientific personnel and of student numbers



Sources: Grund- und Strukturdaten, 1974-1981/1982; Narodnoe chozjastvo 1980 Moscow, 1981.

3. The financing of higher education

The development of the student/teacher ratio in the two countries is mirrored in the development of current expenditures per student. They have risen without interruption in the USSR, whereas there has been a slump in per capita expenditures in the FRG due to political decisions to stop the expansion of higher education and to make universities and Fachhochschulen accept a considerable "overload" of students until the "demographic bulge" will be deflated again in the middle of the nineties (Figure 9). In spite of the unfavourable development of per capita expenditures in the FRG expenditures on higher education have constantly risen in both countries, and we can see from Figure 10 that they have risen faster than total expenditures for education and science. What Figure 10 does not show is the share of higher education in total expenditure for education and science. It is around one fourth of the total expenditures for education and science in the Federal Republic, but only about one eighth in the Soviet Union (Table 3). It is to be noted that in the Soviet Union most of the expenditures for research seem to go to the academies of science and other research establishments outside higher education; further, the Soviet system of higher education may be run more cheaply than that in the Federal Republic because of the high proportion of students admitted for evening and correspondence courses, which are virtually absent in the Federal Republic[1], and because of the higher teaching load which may be imposed in this type of system.

Table 3. Share of higher education expenditures in total expenditures for education and science

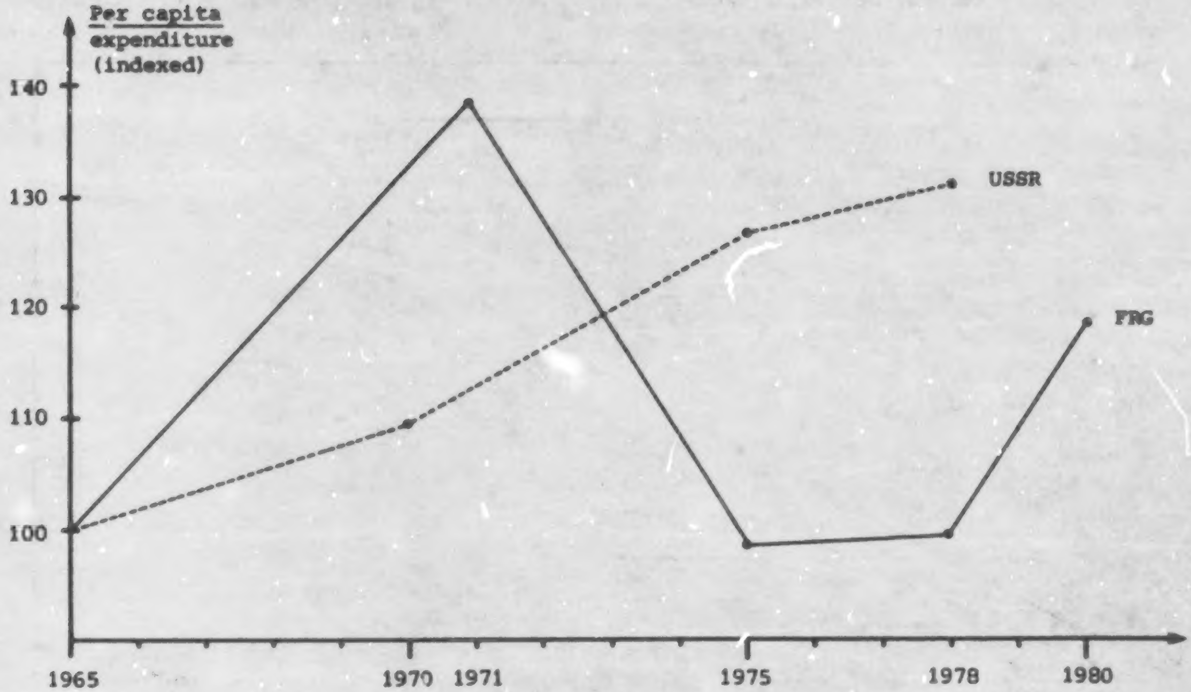
	1965	1970	1975	1980
USSR	10,5%	11,1%	11,3%	12,0%
FEDERAL REPUBLIC OF GERMANY	22,3%	25,0%	23,9%	23,0%

Sources: see Figure 6; own computation

---

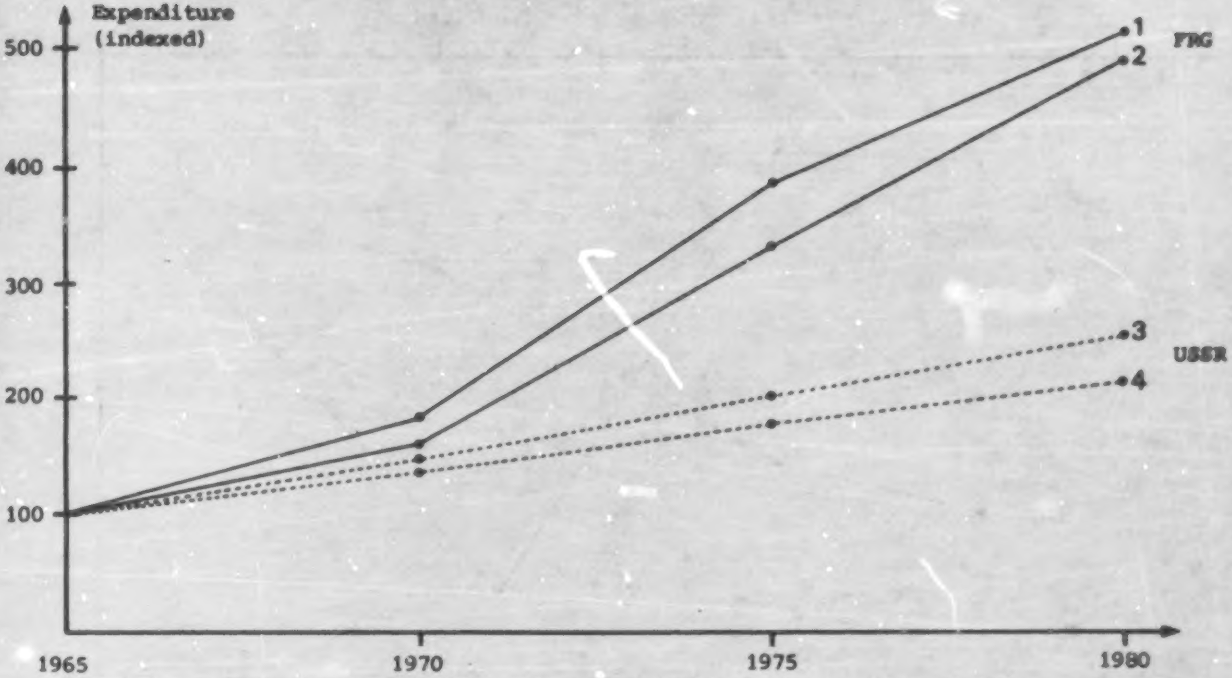
[1] There is only one establishment catering for students by correspondence, the Fernuniversität Hagen, established in 1975, and it already has approximately 30,000 students.

Figure 9. Development of running expenses per student



Sources: Grund- und Strukturdaten, 1974-1981/1982; Narodnoe chozjastvo 1980 Moscow, 1981.

Figure 10. Expenditures for higher education (1,3) and total expenditures for education and science (2,4)



Sources: USSR report, Table 6(Annex) and Table 9(Annex); for the Federal Republic of Germany, see Grund- & Strukturdaten (Basic Data on Education), 1981/1982, p.104 and 148.

4. Norms and realities of access to higher education

In every country access to higher education is governed by specific regulations and procedures. These regulations and procedures pertain to the prerequisites of study, such as having completed secondary education, and to the process of admission proper (such as entrance examinations, maximum numbers of admissions, or rules of distributing would-be students over different geographical regions).

Over and above these formal regulations and the administrative bodies that enforce them, there are societal conditions that influence access to higher education. These societal conditions of access show up clearly in phenomena such as differences by sex and regional and social background in overall enrolment or in enrolment in specific types of establishments or subjects. These social restrictions to access are primary in that they stem from structural constraints given with certain basic aspects of labour, technological development and social structure and it may be quite impossible to neutralise their effects completely. But this does not mean that admission rules and procedures are of minor interest only. As they are no longer applied in a blind endorsement of "social facts" (legitimizing the status quo) and because of their massive influence on initial chances to become admitted, they have gained their own importance[1]. They help influence the number and composition of students each year, thereby influencing the number and composition of graduates and their impact on the structure of the labour force in general.

(a) Rules and procedures of admission

Regulations regarding access and admission are fixed at three levels:

- general norms (for example, constitutional norms)
- laws and other norms regarding requirements of admission
- regulations regarding admission procedures

At the level of general norms there is the right for everybody to enrol at an institution of higher education, if he/she fulfils certain requirements, and in a field of study of his/her own interest and ambition. However, these general norms are open to interpretation; their realization depends on the material means available, and distribution of these means to higher education depends, in turn, on the legitimacy or moral priority of these norms in the face of other general norms.
This can be seen very clearly in the distribution of means to prepare for higher education, in the size of both systems of

---

[1] For an overview see UNESCO/CEPES, Access to higher education in Europe, Bucharest 1981.

higher education and in their respective paths of growth. Further, it can be seen in the rules and procedures that regulate admission to its various establishments and in the immediate results of their application on the composition of the student body.

It should not be forgotten that the second and third levels are, at least in part, dependent on the level of general norms, as these norms (equality, distributive justice, to each according to his/her achievements) have a guiding function in the everyday life of a people and serve as points for articulation of interests. So the rules and procedures of admission have to conform to the general norms; violations are actively resented and reacted against, and result in legal and political conflict. This was massively experienced in the Federal Republic of Germany when the demand for higher education rose to enormous heights, while institutions of higher education were not prepared to handle the ever-growing influx of beginners and the states' administrations could not react rapidly enough to create new facilities and employ additional personnel[1]. When, as a result of this situation, universities began to install regulations restricting access according to the quality of gymnasium-certificates, waiting-time and even aptitude tests, the courts were flooded with complaints; at the same time, "numerus-clausus" regulations quietly became ubiquituous in certain subjects such as dentistry and medicine, because unsuccessful applicants at one university tried to get into other universities in order to get a place for the favourite subject there. In the end, there had to be a constitutional court decision (1972) that defined rights of access for youngsters possessing the hitherto sufficient certificate (Abitur), affirmed their option to choose the subjects they saw fit, obliged legislators and administrators to mobilize all the existing capacities, and allowed restricted admission only if the selection criteria offered a chance for all the applicants to become admitted.

Regulations of admission to higher education in the two countries stand in clear contrast to each other.
In the Soviet Union there is an admission process of three sorting stages for the great majority of applicants wanting to study full-time:

- graduation with a complete certificate from secondary schooling
- passing of the entrance examination
- being admitted, if the results of the entrance examinations are sufficient with respect to the ratio of the number of applicants having fared better and the number of places available.

---

[1] see for example MÜLLER-SOLGER, H., Hochschulzulassung in der Bundesrepublik Deutschland, Bundesminister für Bildung and Wissenschaft, (Admission to higher education in the Federal Republic of Germany. Federal Ministry for Education and Science), Bonn 1976.

This procedure is slightly modified for applicants who, after having completed secondary education, have worked for a minimum of two years; they are preferred to somebody having the same results but who comes straight out of school. The same modification applies to applicants who have shown special competence in fields of knowledge relevant to their future field of study in one way or another[1] and to applicants for fields such as agriculture and forestry, medicine and pedagogics, who bind themselves to go after graduation to a fixed assignment in regions of development, such as parts of Siberia or the Far East or to regions that are underserved. Similarly, youngsters coming from regions without establishments of higher education will be privileged in admission.

The procedure is reduced to a two-stage sorting process for applicants having served in the armed forces longer than required by the draft system and having been sent to the reserves. They are admitted if they have passed the entrance examination.

Another version of the two-stage sorting process was established in 1969, when the ministries of higher education and other ministries having responsibilities for higher education were ordered to install preparatory departments at every establishment of higher education. These preparatory departments are open to persons with a complete secondary education, having worked for at least one year or completed their military service. Selection and delegation of these persons is effected by directors of industrial enterprises or other work organizations, or by military commanders. The persons selected will get as high a scholarship as first-year students. Students who have passed the final examinations (after eight months) will be enrolled for first-year courses without having to undergo entrance examinations[1]. Up to 20% of places for first-year students are reserved for graduates of preparatory departments.

In the Federal Republic of Germany there is still, at least for most fields of study, a one-stage sorting of applicants: if youngsters can show a certificate from a gymnasium (or its equivalents) they are admitted, but not necessarily at a university or Fachhochschule of their choice. Selection for admission may be applied, though, for lack of capacities in a given field. If a numerus clausus is applied, a mixture of criteria is used to select applicants: past achievement as exemplified in the school certificate, waiting time, assignments for the armed forces or special public services, severe handicaps[1].

---

[1] s. Bjulleten' Ministerstva vysšego i strednego special'nogo obrazovanija 1969/10 (s. Anweiler/Kuebart/Meyer, 1976 op.cit. p. 217-219). It is explicitly stated in the document that preparatory departments shall serve to enhance access to higher education for rural and for working-class youth.

This mixed system of admission works flexibly,[2] but it is doubtful whether this smooth working will continue in the near future if the number of students rises as forecast.

It is difficult, if not impossible, to evaluate these two systems of admission as to their inherent justice and economic and institutional effectiveness. It seems correct to assert that a system of admission on the base of a certificate of secondary education only constitutes in fact a "socially conservative method ... because of its inevitable interdependence with a conservative school system".[3] And such a system would collapse if the number of applicants were to rise, because the intake and output of that part of secondary education that leads to the admission certificate have drastically risen beforehand. The different system of secondary education, by now generalized, in the Soviet Union, where nearly everybody of the age-cohorts in question may apply for a place in higher education, makes conscious organization of admission a necessity from the outset. In effect, the organization of secondary education precludes selection that may well be premature. On the other hand, the selective admission necessary to keep in mind other priorities than higher education within a planned economy makes for cumbersome procedures. It runs the risk of perpetuating severe disparities between the number of applicants and the number of places available, either keeping out of study young persons who would be competent but must be denied a place because of the high number of applicants, or admitting other young persons who on grounds of past and present achievement must be looked at as doubtful candidates in fields with few applicants only. On this account, however, the system of automatic admission, indeed any system that relies heavily on school certificates, might fare even worse, because of the unavoidable differences in standard between schools and teachers and its 'streaming' of talents.

---

[1] Müller-Solger, H., op.cit. p.38f. In 1980 a new system of admission has been installed for medicine and dentistry which is based on the aggregate score of grade, point average and test scores, but partly based on a lottery, as well. For more information Teichler, U. Recent developments in higher education in the Federal Republic of Germany: European Journal of Education 1982; p.163

[2] Teichler, U., Öffnung der Hochschulen - auch eine Politik für die 80er Jahre? Gesamthochschule Kassel 1983, Ch.2

[3] Access to higher education in Europe, op.cit. p.54

(b) Selective access to higher education

Overt discrimination as well as factual deprivation of the means for acquiring the personal competence to go into higher education and/or the scarcity of higher education establishments and their size all served for a long time to keep the largest part of an age-cohort out of universities and colleges. Over most of the 19th century women were barred from studying at all or from teaching in higher education in many countries; secondary education leading to higher education was by no means generalized or even available, especially in the countryside. The same is true of universities and colleges themselves. These barriers have been lowered progressively in the course of this century; whether all of them have fallen entirely is doubtful for the Soviet Union and can safely be denied for the Federal Republic of Germany, despite considerable political and financial efforts.

It is undeniably the Soviet Union that had the longest way to go, as we are reminded by the USSR-report in this volume, because of the widespread illiteracy, the lack of schools and of teachers and the desolate economic conditions prevailing in 1917. On the other hand, the new political conditions allowed for sweeping changes and for a realization of equality of opportunity in an unprecedented way. It was the expressed aim of the Soviet power to abolish all barriers of class, region and sex to education and to ensure full participation in societal progress. Education became a matter of high concern.

In the Federal Republic the system of education was inherited and continued to function much as before to discriminate by social class, region and sex, while guaranteeing in the constitution equality of opportunity. In the face of growing demand and because of international economic and political competition ("Sputnik shock") advanced secondary and higher education were allowed to expand, and by the end of the sixties reforms were under way to change the system of secondary education and higher education and thereby to reduce inequality of opportunity.

(i) Regional disparities in higher education

Information about participation in higher education by region or origin and residence (rural or urban) is rather scarce.

We know that there were heavy disparities between regions and between town and country populations in their participation in higher education. We know equally well that these disparities are over-determined in that they are related to industrial and economic development on the one hand and to the social position and differentiation of these populations on the other.

In the Federal Republic there was a very low relative participation in higher education, for example, of the population in parts of rural Bavaria as well as from the densely populated and heavily industrialized Ruhr region, whereas regions that could boast a university and/or were cultural and political centres had comparatively higher participation rates.
Establishments of higher education have their own effects of mobilization and attraction in that they contribute to a generalized climate of openness toward learning and cultural innovation. Given these differences in participation rates may always persist and may not be compensated entirely by extended utilization of media for teaching or easy ways of spatial access through ample student lodgings, etc.
As far as one can judge from the information available there still are regions that have only few establishments of higher education or that are less prone to instill sufficient competence and interest for higher education into their youth compared with other regions that are represented more often. This seems to hold for both countries.
For the Federal Republic there are data for 1960/61 that show regional participation rates on the level of the 11 Länder between 2.5 and 6.5 per 1000 inhabitants, and in 1978 there are comparable differences between 8.8 and 16.8 per 1000 inhabitants[1]. If one looks at differences at the level of administrative units (districts and towns) participation of the population 18 to 25 years old ranged from 4.6% to 24% in 1978.
Looking at participation rates in the Soviet Union we can show the total number of persons having secondary or higher education by rural/urban residence and sex.

It is seen on inspection of Table 4 that differences by sex do not exist. There is a gap only between urban and rural zones as regards higher education. But it is due first of all to the different nature of rural and urban activities. Concerning the situation in the republics, remarkable progress has been achieved in reducing disparities[2]. Real achievement in eliminating these disparities depends on many factors which

---

[1] See for these and the following information on the Federal Republic Framhein, G., Alte und neue Universitäten (Old and New universities) Schriftenreihe Hochschule 44, Bundesminister für Bildung und Wissenschaft, Bonn 1983; see esp. pp.66 ff.

[2] See details, Narodnoe chozjastvo, SSSR, 1922-1982, M. 1982, p.44.

Table 4. Educational level of population in the Soviet Union

	Per 1000		Per 1000				Per 1000			
	Persons with higher and secondary education	Persons with higher education	Persons with higher and secondary education		Persons with higher education		Persons with higher and secondary education		Persons with higher education	
			Urban	Rural	Urban	Rural	Men	Women	Men	Women
Population from 10 years of age										
1939	108	8	218	52	19	2	127	90	11	5
1959	361	23	469	256	40	7	392	338	27	20
1970	483	42	592	332	62	14	522	452	48	37
1979	638	68	723	492	93	25	685	597	75	62
1982	670	76	748	529	104	25	715	632	83	71
Employed per population										
1939	123	13	242	63	32	3	136	104	16	9
1959	433	33	564	316	59	11	434	431	34	32
1970	653	65	748	499	90	25	654	651	68	42
1979	805	100	863	693	130	42	810	801	102	98
1982	846	110	888	758	139	48	851	840	112	107

Source: Narodnoe chozjastvc SSR, 1922-1982, U. 1982, p.42, 43.

BEST COPY AVAILABLE

are beyond the scope of the present study.

(ii) The participation of women in higher education

BEST COPY AVAILABLE

Ever since higher education has existed, and well into the present time, women have been either barred altogether from higher education or were in a minority position there, be it at the student level or at the level of scientific personnel. In most countries, an additional characteristic is the concentration of female students in some fields of study, that mirrors women's place in the sexual division of labour in the society at large.

Have our two countries made some headway toward an equal share of women in higher education?

Figure 7 shows that participation at the student level has never been pronouncedly biased in the Soviet Union since 1950. Though after an initially equal representation of the sexes in 1950 and 1955 there was a slump in female participation in the sixties[1]. This imbalance was redressed in the course of the seventies, and in 1980 the weights have changed even in favour of the women (52%) as their share in the total population of the relevant age brackets has fallen below 50% now.

From an initial 16% in 1950 the participation of women has risen to 34% in the Federal Republic of Germany, their share in the number of first-year students has risen from 25% in 1955 to 43% in 1980 (all of higher education except the Fachhochschulen).

So, on the whole, representation of women in higher education does not seem to be a problem in the Soviet Union, whereas there is a persisting albeit lessening bias in favour of the male population in the Federal Republic of Germany.

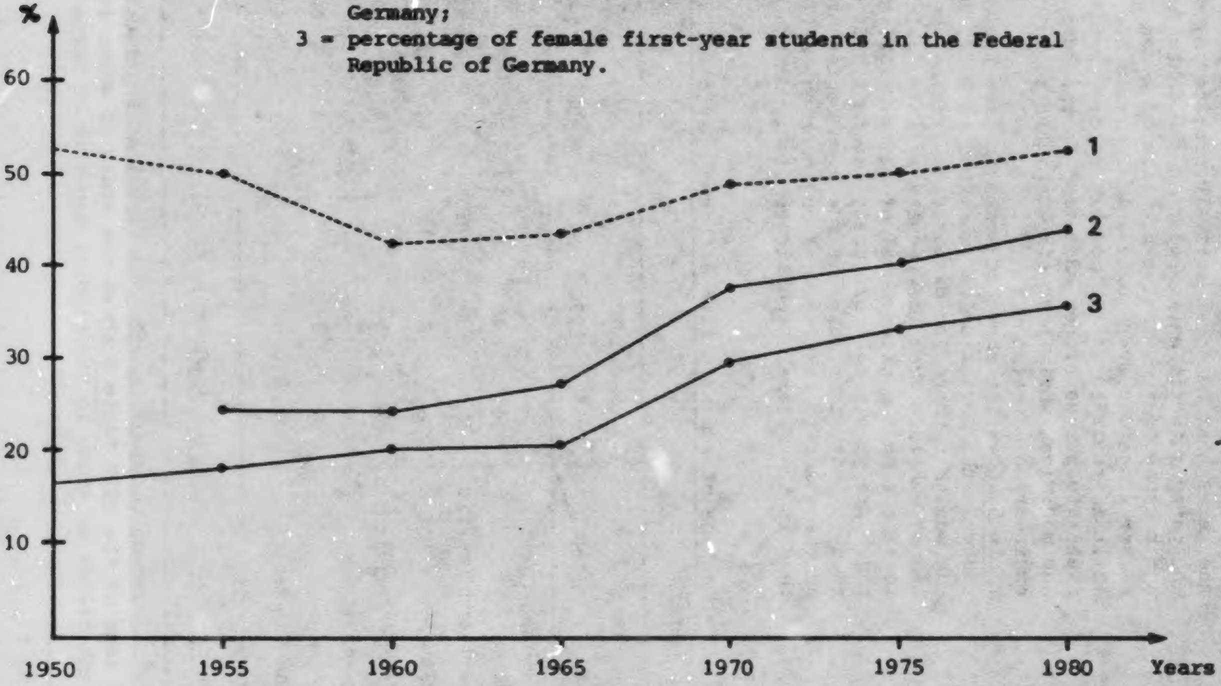
How are male and female students distributed over fields of study? It is to be expected that the distribution of female students is more even in the Soviet Union than in the Federal Republic of Germany, because of the Soviet conception of equality between

---

[1] The UNESCO population statistics show for 1973 in the age bracket 40-49 the share of women with 54,2% and in the age-bracket of 30-39 the women's share is 51.0%. From 20-29 the percentage is 49.4 and from 10-19 it is 49.1. The overall sex ratio in the population of the Soviet Union had been 53.2% females to 46.8% males (see UN Yearbook 1982, pp. 234 f) by that time.

Figure 11. Participation of women in higher education

1 = percentage of female students in the USSR;
2 = percentage of female students in the Federal Republic of Germany;
3 = percentage of female first-year students in the Federal Republic of Germany.



Sources: USSR country report in this volume (Annex) Table 12; Albert, W./Oehler, C, 1969 op.cit. p.190 op.cit. p.190ff. Grund- und Strukturdaten 1981-1982.

the sexes that has been actively promoted by state and party authorities at least in the sphere of work, and because of the massive presence of women in higher education over quite a long period now, even if it is remarked in the country report that "girls prefer to pursue higher education in the humanities and medicine, while boys aim at higher technical engineering education".[1]

Table 5 shows the share of women in five fields of study in the Soviet Union from 1955 to 1980, and we can see that there are disparities, indeed, but one cannot conclude from the results in this table, at least not on the given level of abstraction, that there are purely male or purely female fields of study. Most impressive is the even representation of the sexes in the field of engineering, a field that in the Federal Republic is highly dominated by men.

Table 5: Percentage of women in five different fields of study, USSR

Year Field	1955	1970	1975	1978	1980
Industry and Construction	44	49	50	51	52
Transport and Traffic	31	38	40	41	42
Agriculture	26	30	33	34	34
Economics and Law	54	60	62	64	67
Public Health and Sports	54	56	56	57	58
Arts and Cinema	66	66	68	69	69

Source: Narodnoe chozjastvo 1980, Moscow 1981; p. 473

Trying to remain on the same level of abstraction as in the case of the USSR Table 6 shows the share of women in six different fields of study in the Federal Republic of Germany[2].

---

[1] s. Ch. III.1

[2] See as well Table 6 in the FRG report; there the distribution of female students over the different fields of study is demonstrated.

Table 6. Percentage of women in six different fields of study, FRG (universities)

Field / Year	1950	1960	1968	1975	1978	1980
languages, humanities and sports	27.0	37.3	52.2	55.3	55.7	56.5
economics, law and social sciences	9.9	13.3	12.1	24.1	27.2	29.6
mathematics and science	20.3	18.3	17.8	32.4	33.9	34.0
engineering	1.6	1.8	2.5	6.4	7.2	8.2
human and vet. medicine	22.7	29.4	26.7	29.1	32.3	35.2
agriculture (and household economics)	6.9	5.0	20.1*	48.9	45.8	45.6

Source: See Figure 11. *Category has been changed by including household economics

The whole field of engineering is a male domain (there is a sizeable group of women in architecture only), and there is a clear majority of men in every field of study except languages, humanities and sports, where so far most of the students want to become teachers (which is true, but to a lesser extent, for mathematics and science, too).

The movement toward female participation in higher education has been fairly steady in the Federal Republic of Germany, so far, and there was a steep rise from 1960 to 1968 in female participation on the whole (s. Figure 11) and in languages and the humanities especially, because of the prospects of school-teaching as a secure and remunerative type of professional activity. But it remains to be seen whether this movement will continue, because diminished opportunities for newcomers on the labour market are affecting women more severely than men (see Section III) Now, participation in higher education at the student level is one aspect, but how do women participate in teaching and research? The answer seems to be clear for the Federal Republic of Germany: an even more severe sex bias will reign in higher-education employment than in higher-education studies.

But it would be intriguing to know whether there is a continuity between participation as a student and participation in higher education employment for women in the USSR or whether this field of employment, and especially its higher echelons, remains a male stronghold, so far?

There is a table in the Statistical Yearbook of the Soviet Union showing the development that differentiates employees in research and development after academic status whose information is reproduced here in modified form (Table 7). If one looks at the overall participation in research and development, women seem to approach equal representation (1950: 36%; 1980: 40%), but this impression is superficial, because they are heavily under represented in all the higher status categories: the higher the academic status (members of academies and professors, doctors of science) the smaller the share of women.

In fact, only a minority of the women engaged are identified by academic status at all (between 31% and 33% in the period of 1965 to 1980) which may well mean that the majority of them have only a first degree and are working outside higher education and research institutes proper.

The changes in female participation over the years are small. So, if judged correctly by the data given, research and development in the Soviet Union is a stronghold of academic men; most of the women working there do so in inferior positions.

The participation of women as teachers and researchers in higher education in the Federal Republic of Germany is much smaller than in the Soviet Union. Their share in the number of university teachers in 1980 was 10.2% overall and only 4% of them have positions as full professors[1].

(iii) The social background of students in higher education

Given a physically healthy child, it is the external conditions of its socialization and individuation that will largely decide its development, i.e. the attainment of proficiency in various fields of activity,

---

[1] See Clemens, B., Frauenforschungs- und Frauenstudieninitiativen in der Bundesrepublik Deutschland, Wissenschaftliches Zentrum für Berufs - und Hochschulforschung der Gesamthochschule Kassel, 1983; p. 18.

Table 7. Scientific personnel in research and development, by sex, 1950-1980, USSR

	Year									
	1950		1965		1970		1975		1980	
Sex Status	male	female	male	female	male	female	male	female	male	female
Candidates of science	34.1 (75%)	11.4 (25%)	96.6 (72%)	34.8 (28%)	163.8 (73%)	60.7 (27%)	232.8 (71%)	94.0 (29%)	285.0 (72%)	111.2 (28%)
Doctors of science	7.7 (93%)	0.6 (7%)	13.4 (91%)	1.4 (9%)	20.5 (87%)	3.1 (13%)	27.8 (86%)	4.5 (14%)	32.5 (86%)	5.2 (14%)
Members of Academies and Professors	8.4 (94%)	0.5 (6%)	11.4 (91%)	1.1 (9%)	16.3 (90%)	1.8 (10%)	20.5 (90%)	2.4 (10%)	24.4 (89%)	3.0 (11%)
Lecturers	5.7 (64%)	3.2 (36%)	39.1 (80%)	9.5 (20%)	54.2 (79%)	14.4 (21%)	68.3 (78%)	19.6 (22%)	84.4 (76%)	26.3 (24%)
Collaborators on high echelon	7.9 (69%)	3.5 (31%)	20.4 (71%)	8.3 (29%)	29.2 (75%)	9.8 (25%)	40.8 (77%)	12.5 (23%)	51.1 (77%)	14.9 (23%)
Collaborators on lower echelon and assistants	10.2 (52%)	9.4 (48%)	23.9 (49%)	25.0 (51%)	24.5 (50%)	24.3 (50%)	22.7 (50%)	22.3 (50%)	22.0 (54%)	19.1 (46%)
Status not identified	16.6 (35%)	30.4 (65%)	207.8 (54%)	174.7 (46%)	259.3 (51%)	245.8 (49%)	322.2 (49%)	333.0 (51%)	325.8 (47%)	368.4 (53%)
Total	103.5 (64%)	59.0 (36%)	409.8 (62%)	254.8 (38%)	567.8 (61%)	359.9 (39%)	735.1 (60%)	488.3 (40%)	825.2 (60%)	548.1 (40%)

Source: Narodnoe chozjastvo 1980, op.cit., p.95

BEST COPY AVAILABLE

BEST COPY AVAILABLE

academic or other. The position of the child's family in society, as exemplified by the place of its parents in the division of labour and in hierarchies of remuneration, forms a powerful part of these external conditions and heavily influences the personality, so far as the early years can be supposed to be formative in this respect. Further, the social position of the family may translate itself into a source of power, esteem and propriety in the eyes of others who matter (school teachers and administrators, for example) and may lead to differences in treatment of children. Third, families who differ in their social positions may be discerned as well in their "cultural profile" (activities, articles of cultural consumption, encouragement for curiosity and achievement) which depend on the parents' education, their type of work and their incomes.

Filippov, a Soviet sociologist, even goes as far as speaking of a "linear correlation between the complexity of work, parents' level of qualification and education and the share of students of different social origin."[1] In his study on the effects of students' social background he showed the importance of the family's social position in the Soviet Union. In his students' sample from many establishments of higher education he found a definite over-representation of employee families' offspring, and there were clear differences in the social composition of students in different types of establishments: the students of workers' families had a share of 26.7% of the student population of the universities, 34.5% of the technical universities and 38.1% of the number of students at colleges of teacher training.

Now we know from Table 29 in the country report on the Soviet Union that nearly 57% in 1970 and 62% in 197 of the active population are workers, so students from workers' families seem to be underrepresented. On the basis of this table a representation index was established for the two years 1969/70 and 1975/76 to show how the different social groupings are represented in higher education at the student level (1.00 means even representation). By this method, an under-representation of worker's families of one third and of kolkhoz-farmers' families by nearly two thirds is revealed. By contrast the families of employees are overrepresented one and a half times (1969/70). This picture is redressed slightly in 1975/76, but the main imbalances between the three different social categories remain (Table 8)

---

[1] See Filippov, F.R. in Sociologiceskie issledovanija 1977/2; p.5 cited from Novikov, L. 1981, op.cit.; p. 34

Table 8 Representation of different social groupings in the student population, USSR (1969/70 and 1975/76)

Social groupings / Year	1969/70	1975/76
Workers	0.65	0.74
Kolkhoz-farmers	0.41	0.48
Employees	2.40	2.07

If there is a differential participation in higher education by social background, while the class that matters most in the Soviet Union is under represented this is an effect of the pervasive force of the societal division of labour which cannot entirely be neutralized either by subsidies or by preparatory classes and special admission rules.

Looking at participation in higher education in the Federal Republic of Germany there have been changes from an extreme underrepresentation of workers' and farmers' offspring toward a more moderate situation which is demonstrated by Table 11 of the country report in this volume. Still, the situation is much more serious in this respect than in the Soviet Union, if one is inclined to believe that everybody should be allowed to develop his or her talents to their full and/or to enjoy higher education as a possibly significant opportunity of personal development.

The data in Table 11 of the FRG-report have been treated drawing on additional information from the Statistical Yearbook about the distribution of the active population over four occupational categories similar to those from the report on the USSR just given. The resulting Table 9 shows a still heavy underrepresentation of the offspring of workers' families. If the youth of a Soviet working-class family has a chance three times smaller to study at a university in 1975, compared with a youth from an employee's family, the chance of a youth from a worker's family in the Federal Republic of Germany to go to a university is about nine times less than that of a youth of a state official's family, eight times less than that of the family of a self-employed and still three times less than that one out of an employee's family. The changes are a bit more even for college (Fachhochschule) attendance but they are markedly skewed, too.[1]

So both systems of higher education are systems of large numbers of students, but only the Soviet one seems to be approaching the state of mass higher education. However, the difference between the desirable and the reality of class in higher education may be more resented in the Soviet Union than in the Federal Republic of Germany, if one judges correctly from the political measures taken to abolish class barriers in the former, whereas in the latter subsidies for pupils going to gymnasium are drastically curtailed and are switched to a system of loans for students.

Table 9. Representation of different social groupings in the student population, Federal Republic of Germany (1976,1979, 1982)

	Year					
	1976		1979		1982	
Type of higher education / Occupational group	University	Fachhochsch.	University	Fachhochsch.	University	Fachhochsch.
Civil service	2,64	2,31	2,47	2,13	2,41	2,30
Self-employed	2,91	1,63	2,79	1,63	2,76	1,72
Employee	0,99	0,88	0,98	0,87	0,97	0,94
Worker	0,31	0,66	0,33	0,64	0,39	0,68

Source: Statisches Jahrbuch der Bundesrepublik Deutschland 1977, 1980, 1983; Teichler, U., Sanyal, B. in this volume, Table 11.

---

[1] It is not be to overlooked that social categories differ between the two countries; still, the general observation seems to hold in that social background has a larger effect on access to higher education in the Federal Republic of Germany than in the Soviet Union.

III. HIGHER EDUCATION AND EMPLOYMENT

1. An overview

The general lines of development of higher education in quantitative terms have been largely identical in the Soviet Union and in the Federal Republic of Germany. There have been differences mainly in the time when the post-war expansion started and in the growth rates, but not in the main trend. This result is not surprising given that both countries had to reconstruct material and immaterial losses due to the war and to incorporate new scientific and industrial developments or develop new ones on their own in order to modernize and develop their respective economic resources and facilities. All this had to be done on a large scale and quickly in a world that had changed completely in many respects and where both countries had experienced a dramatic change of position in the distribution of power in Europe and well beyond.

The need for a large-scale employment of highly qualified manpower must have been even more pressing in the USSR than in the Federal Republic of Germany (for reasons to be dwelt on later, see 3.) and this may explain in part the emphasis put on courses by correspondence and on evening courses[1] which helped to overcome the influence of pre-war fertility patterns and the severe losses in the war. Still, it took quite a long time, up to the seventies, to satisfy quantitative demands for graduates of higher education. In between, many posts for highly qualified manpower were filled by persons with a different occupational background.

The same must have happened in the Federal Republic of Germany, but until the 'Sputnik shock' of 1957 and after there was not any visible public concern for a rapid expansion of higher education and research in the interest of the economy or international economic and political competition. There were, of course, no difficulties for either private or public employers to absorb all the graduates willing to be employed. There was a short-lived recession lasting from the end of 1966 into the first half of 1968 that was marked by some thousands of engineers being out of work, but well into the seventies there were no serious absorption problems for the graduates of higher education, which testifies that their skills were needed (and well-paid).

---

[1] See Annex, Table 5 of the original USSR report.

First signs of saturation of demand for graduates of higher education in the Soviet Union can be seen in the seventies, too; it is from this time on that the growth rates in admissions flattened.

Within the period from 1950 to 1970 there have been enormous changes in the overall structure of the economy of the two countries: their definite urbanization and industrialization accompanied by an augmentaton of the service-sector. This development has continued in the seventies and an end, especially for the Soviet Union that still is comparatively more rural than the Federal Republic of Germany, is not yet in sight. What seems to have stopped definitely, though, is the proliferation of public services in the Federal Republic of Germany; their share in total employment may even shrink in the coming years.

The developments hinted at are illustrated with two figures: Figure 12 shows changes in the distribution of the working population over the sector of agriculture (primary sector), industry (secondary sector) and services, both public and private (tertiary sector), for the Federal Republic of Germany and for the Soviet Union.

Figure 13 illustrates changes in the composition of the labour force of the two countries by showing the rising share of academically trained manpower within the total labour force. There exist close correlations between the different lines of development shown in the two figures in that the rising importance of the tertiary sector has given ample opportunities for graduates of higher education, which have been enhanced further by an "inner tertiarization" of production enterprises because of the necessity of large-scale research, development and industrial engineering.[1]

If indeed it is a fact that these global changes in the societal division of labour have taken place more slowly in the Soviet Union, then it might be interesting to know why there are comparatively more persons with completed higher education than in the Federal Republic of Germany, what their tasks are and in what positions they are employed.

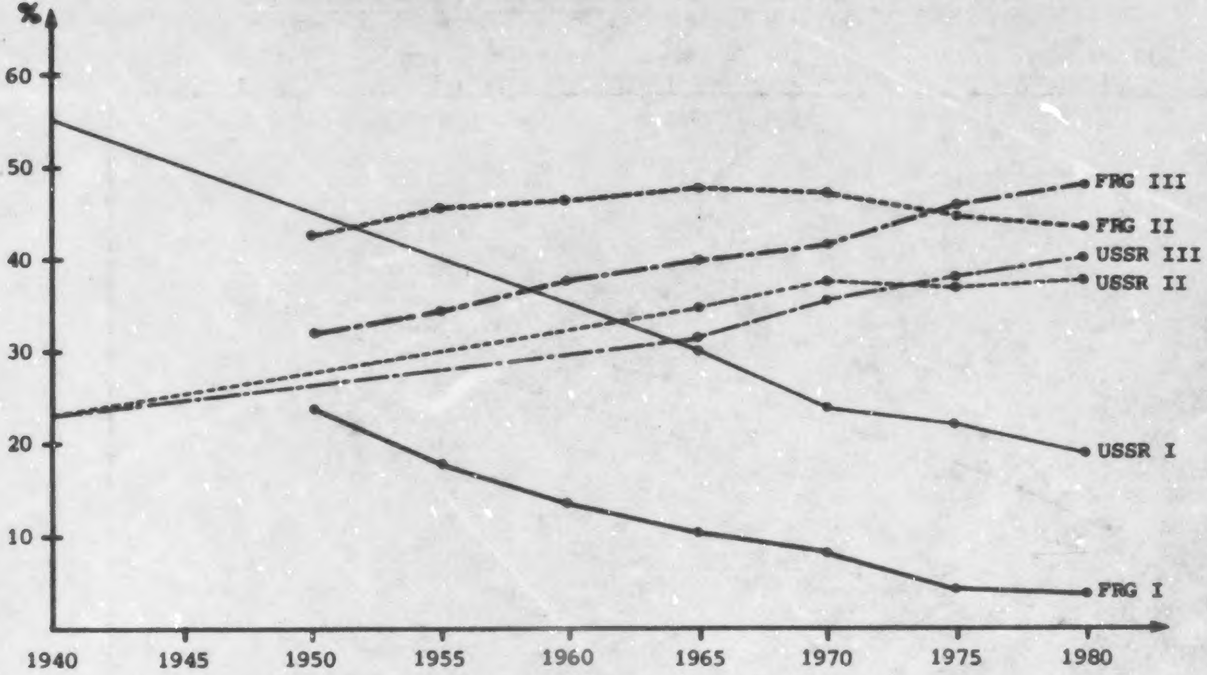
2. Developments in graduate employment

In Section II the report on the development of student numbers in different fields of study revealed large differences between the two countries. Whereas in the Soviet Union engineering was studied by nearly half of the students in the sixties and seventies

---

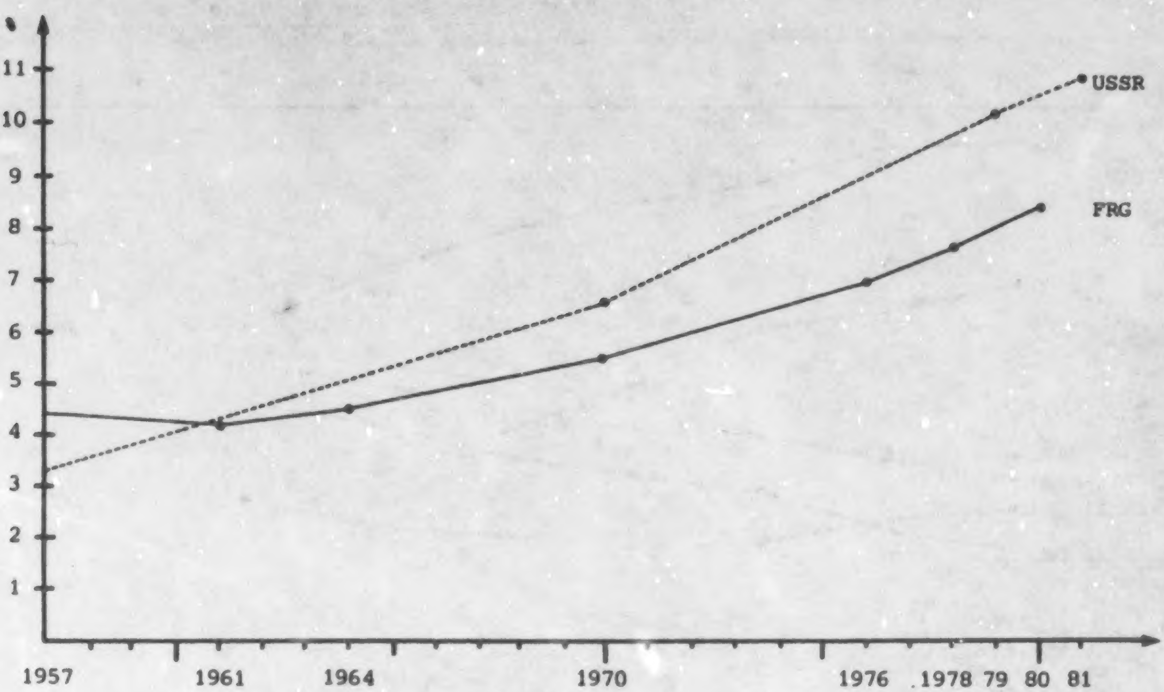
[1] A glimpse of what is called "inner tertiarization" here may be obtained from Table 3 of the report on the Federal Republic of Germany in this volume.

Figure 12. Distribution of the labour force over Primary(I), Secondary(II) and Tertiary(III) sectors



Sources: Narodnoe chozjastvo 1980 op.cit. p.355. Federal Republic of Germany countries report in this volume, Table 1.

Figure 13. Graduates of higher education in the active population (in percentages)



Sources: Narodnoe chozjastvo 1980 op.cit., p.28, BLK, Strukturprobleme zwischen Bildungs- und Beschaeftigungssystem und ihre Konsequenzen für die Bildungsplanung, Bonn, 1983, p.36.

the most frequented fields of study in the Federal Republic of Germany had been those related to teacher-training in that period.

These developments have influenced the overall composition of the graduates, too, as can be seen from tables in the two country reports.[1]

Of course the composition of the new graduates does not allow any judgement on the composition of the highly qualified manpower of the two countries in general, but it gives an impression of the future composition, especially if the number of young graduates exceeds so drastically the number of graduates one generation ago. This is why we shall look first at the composition of the graduates from 1950 onwards before looking at the composition of the total number of highly qualified manpower and its distribution over different sectors and branches of employment. The last section will be devoted to problems of 'mismatch', i.e. unemployment and inadequate employment in both countries.

(a) Number and composition of young graduates

There are remarkable growth rates for the number of graduates in the Soviet Union. Between 1950 and 1980 their total annual number grew four and a half times (from 179,000 to 817,000); the development in the various fields of study corresponds closely to the development in admission numbers and numbers of students. Fields such as economics and engineering have grown twice as fast, whereas the fields of law and public health grew only half as fast as average, and agriculture and forestry and arts and sciences grew a little faster than average. Table 10 gives the relative number of graduates in these fields.

As a result of this development engineering and teacher training have changed places in importance, and economics ranges third. Higher education trains many more persons for positions outside education now than it had to do in the fifties.

In the Federal Republic there are no clear-cut trends in the number of graduates of different fields of study, apart from teacher training, that has known a veritable upsurge in the sixties and seventies, owing to the excellent employment outlooks for teachers (see Table 11). The picture given by Table 11 is incomplete, though, because college graduates are excluded. The Fachhochschulen have trained preponderantly engineers well into the seventies; therefore the total number of engineers is higher than shown here, and their share will be higher, correspondingly (see comment to Table 12).

---

[1] See USSR-report, Annex; Tables 9 and 9a in the Federal Republic of Germany report.

Table 10. Composition of the number of new graduates by field of study, USSR

Year	Law	Economics	Public Health	Teacher Training	Agriculture and Forestry	Arts and Sciences	Engineering	Total
1950	3.2	5.6	11.6	43.9	7.2	6.9	21.9	100.0
1955	3.3	6.6	6.9	40.0	10.0	6.3	26.9	100.0
1960	1.7	8.9	8.9	29.6	10.0	8.7	33.2	100.0
1965	1.7	10.1	7.7	24.6	8.4	7.6	39.9	100.0
1970	1.3	12.0	6.9	24.1	9.2	7.7	38.8	100.0
1975	1.8	13.4	7.6	21.7	7.6	7.7	40.2	100.0
1980	2.0	13.2	7.3	20.5	7.9	7.8	41.3	100.0

Source: USSR, original report, Annex Table 9.

Table 11. Composition of the number of new graduates by field of study, Federal Republic of Germany (universities)

Year	Languages, Humanities	Economics & Social Science Law	Math. & Science	Engineering	Medicine	Agriculture Forestry	Teacher Training	Total
1952	6.9	20.3	10.0	9.7	24.4	3.4	25.4	100.0
1956	7.9	21.7	11.3	12.7	15.2	2.5	28.6	100.0
1960	6.3	18.7	10.6	11.3	15.1	1.7	36.1	100.0
1964	5.9	14.9	7.9	10.7	16.0	1.2	41.7	100.0
1970	4.9	16.9	9.2	8.1	20.1	1.5	36.8	100.0
1975	7.3	14.5	10.0	7.1	13.4	1.6	46.0	100.0
1980	9.3	17.4	10.5	8.8	16.7	2.3	35.0	100.0

Source: Buttgereit, M. 1983, op.cit. p.217f.

Table 12. Composition of the academically trained manpower, the Federal Republic of Germany (university graduates)

Year / Field of study	1961 (census)	1970 (census)*	1980 (microcensus)*
Arts	26,9	36,0	31,2
	3.5	3.4	2.2
Languages, humanities, teacher-training	292,3	425,6	617,1
	37.8	39.7	44.4
Economics and social science	57,7	103,3	143,5
	7.5	9.7	10.3
Law	82,8	93,6	98,2
	10.7	8.7	7.1
Science and mathematics	52,2	91,2	115,1
	6.8	8.5	8.3
Engineering and architecture	100,2	113,3	117,7
	13.0	10.6	8.4
Medicine and pharmacy	140,4	183,9	191,5
	18.2	17.2	13.7
Agriculture, forestry, household science	19,5	22,0	22,0
	2.5	2.1	1.6
Other; not identified	0.5	1.2	55.6
	0.1	0.1	4.0
Total	772,5	1070,1	1391,9
	100.0	100.0	100.0

Source: Based on Bund-Länder-Kommission für Bildungsplanung und Forschungsförderung (BLK): Strukturprobleme zwischen Bildungs - und Beschäftigungssystem und deren Konsequenzen für die Bildungsplanung - (Problems of structural relations between education and employment and their consequences for educational planning), Bonn 1983; p.38.

*Germans only.

(b) The composition of highly qualified manpower and its distribution over the economy

How is the total stock of academically trained manpower composed and how is it distributed over the different sectors and branches of the societal division of labour?

These questions can be answered only approximately. Judged by Table 13, which covers employed university graduates only, the preponderance of graduates of teacher training, languages and humanities is surprisingly big in the Federal Republic of Germany, and their number has been growing faster than average; apart from this group only the numbers of economists and social scientists and of natural scientists and mathematicians grew faster than average; all the others lost ground, most notably physicians and engineers.

An attempt to include the graduates of the Fachhochschulen reveals, however, that approximately three-fourths of the engineers would be excluded if one had to rely on statistics about university graduates only. Figures compiled recently by the Institute for Labour Market and Occupational Research give the total number of engineers as 482,000, which might still be an underestimation, and the total number of academically trained manpower employed as 2,056,000, resulting in a share of more than 23 per cent for the engineers and approximately 34 per cent for teachers and other graduates in the fields of language and humanities.[1]

Unfortunately, no comparable data on the composition of the academically trained manpower in the Soviet Union was found, apart from figures about the new graduates already reported in Table 10.

The distribution of the academically trained manpower over the major branches of employment is very uneven, as far as may be judged from the information given in Table 13. The largest number of graduates of higher education in both countries is working in the sector of education, arts and sciences, that accounted for more than 42 per cent in the Soviet Union and 43 per cent in the Federal Republic of Germany in 1980.[2] Apart from this similarity, graduate employment differs between

---

[1] These numbers are the result of own computations on the base of data given in Chaberny, A., Parmentier, K., Schnur, P. "Berufsspezifische Strukturdaten," (Structural data on occupations) Beiträge zur Arbeitsmarkt- und Berufsforschung No.60, Nürnberg 1982. The data come from the microcensus of 1980 and are not totally reliable; as they do not allow an identification of graduates by field of study for about half of the professional fields I have abstained from reproducing them in a table.

[2] A longitudinal comparison cannot be undertaken, because the Soviet data include the number of persons with a degree from a secondary specialised school (except for 1980).

Table 13. Distribution of highly qualified manpower over branches of employment, USSR and FRG (percentages) [*]

	1941	1961	1965	1970		1980	
	USSR	FRG	USSR	USSR	FRG	USSR	FRG
Agriculture, Forestry	2.7	0.8	5.2	5.8	0.6	6.5(4.7)	0.5
Industrial Production	13.5	12.9	25.1	27.7	13.4	31.5(22.4)	11.2
Construction	3.1	1.1	6.5	7.7	1.1	9.1(9.3)	0.9
Transportation, tourism	2.6	1.5	4.0	4.3	1.7	5.1(3.1)	1.6
Commerce	-	5.0	-	-	4.8	-	4.0
Banking, insurance, consulting and other services	0.7	8.3	1.3	1.5	8.4	2.2(1.2)	7.8
State and social insurance	11.4	10.8	6.4	6.3	9.8	5.7(7.8)	10.9
Health	19.4	13.9	15.3	13.9	12.3	11.7(7.8)	12.3
Education, arts, research, publishing	44.2	39.4	34.7	31.4	43.5	26.8(42.2)	43.1
Non-profit, social organizations	-	5.8	-	-	4.5	-	7.6
Total	100.0	100.0	100.0	100.0	100.0	100.0(100.0)	100.0

Sources: Narodnoe chozjastvo 1980, op.cit., p.355, 357 f., 369 f., Bund-Länder-Kommission op.cit. 1983; p.42

[*] The figures for the USSR include the numbers of persons with a degree from secondary specialised schools, the figures for 1980 in () give the distribution of graduates from higher education exclusively. The FRG figures refer to university graduates only.

the two countries most of the time, most remarkably with respect to agriculture, banking and insurance and health. These differences may be due to differences in the societal division of labour in general, as the whole tertiary sector employs more persons, relatively, in the Federal Republic of Germany than in the USSR, and due to differences of categories - for example, in the USSR consulting seems to be part of research.

Immediately striking are the differences between the two countries in the shares of graduates the various branches are employing. Looking at the data for 1980 one wonders why 4.7 per cent of the Soviet graduates are employed in agriculture and forestry against 0.5 per cent of the graduates in the Federal Republic of Germany, or 9.3 per cent against 0.9 per cent in construction. To be sure, these differences are inflated because the data for the Federal Republic of Germany do not include Fachhochschule - graduates. But even if one trebled the number of graduates in branches like construction, which may be realistic given the high number of college engineers working there, a big difference would remain. The same is true for industrial production.

These differences in the distribution of graduates over branches of employment lead to the differences between the two countries as shown in Table 14. Again, the exclusion of college graduates in the case of the Federal Republic of Germany makes the differences appear greater than they may be in reality, but the differences are not only due to this exclusion. Otherwise, the difference in the branches of education, research etc. would have to be reversed - that is, it would have to be expected that the proportion of graduates in the total amount of persons employed in this field would be greater in the Soviet Union than in the Federal Republic of Germany. Instead we can see that more than half of the number of persons employed in this field are higher education graduates in the Federal Republic of Germany against one third for the Soviet Union.[1]

All in all this part of the comparative analysis seems to be the least satisfactory, given the paucity of data and the differences in the categories employed. To be sure, part of these differences point to differences in the general set-up of the two societies, and to make them comparable in a stricter sense would be possible only on the base of original research in both countries on the level of task assignments, qualification requirements and patterns of organizational division of labour.

(c) On the utilization of highly qualified manpower

A central concern for professors, educational administrators,

---

[1] This comparatively low rate of academization may be due to a rather late incorporation of teacher training into the realm of higher education.

Table 14. Share of graduates in the labour force by economic sector

Year Branch	1961		1970		1980
	FRG	USSR	FRG	USSR	FRG
Agriculture, forestry	0.2		0.3	2.3	0.5
Industrial production	1.0		1.4	7.1	1.8
Construction	0.4		0.7	10.0	0.7
Transport, tourism	0.5		0.9	3.1	1.1
Commerce	1.2		1.6	-	1.9
Banking, insurance, consulting and other services	4.6		5.4	9.6	5.6
State and social insurance	5.7		5.0	37.9	7.7
Health	17.8		16.5	15.1	15.7
Education, arts, research, publishing	42.6		49.3	33.3	51.6
Non-profit and social organizations	8.5		14.4	-	21.5

Sources: See Table 13

planners, and politicians alike is how and where the graduates they have helped to produce are employed, because employment is a a crucial measure of their achievement, so far as higher education can be said to provide an education that is useful for the fulfillment of certain tasks in sectors of employment outside higher education. We may discern two main indicators of underutilization of graduates: Unemployment and underemployment.

Now, while unemployment may be fairly easily ascertained, problems of registration and statistical feed-back notwithstanding, underemployment is not. First, whether an employment is seen as being adequate or not may be a matter of opinion based on norms that may have been valid a generation ago, but do not apply any longer because of general changes in the production structure, in the composition of the labour force in its totality or of changes in the employment level. Second, it may be in the interest of a certain group, professional or other, to judge the employment of graduates adequate or not in order to promote or ward off claims of certain categories of graduates or of other occupational categories without much empirical grounding. Third, as there are several dimensions by which an employment may be judged as adequate or not with respect to content, standards and length of education, judgement on its adequacy will depend on the dimensions felt relevant; there are, in other words, different forms of inadequacy.

For the sake of briefness we shall concentrate on the several dimensions by which inadequacy is perceived and will leave out matters of norms and interest as far as can possibly be done.

Looking at unemployment first, the comparison can be made very quickly in that it may be stated that one country (the Federal Republic of Germany) knows it and the other does not, or knowns it only in some form due for example to waiting times between one employment and another, which in no way infringes on the right of every citizen to be employed gainfully and according to his skills. Still, it would mean the omission of an important aspect of graduate employment if unemployment were brushed over in this way. We shall therefore attempt to point to (a) some of the quantitative aspects of graduate unemployment in the Federal Republic of Germany, (b) whether the risk to become unemployed differs according to field of study and (c) whether other occupational groups may fare better on the labour market than the graduates of higher education.

Graduate unemployment is a phenomenon that has come into existence in the seventies, only. There was some unemployment in the recession of 1967/68, but surplus manpower was quickly reabsorbed then[1], and it hit only graduates of those groups, who are predominantly employed in the private sector of the economy, such as engineers, chemists, physicists and the like, whereas overall graduate employment continued to rise.

---

[1] see Buttgereit, M. Ingenieur und Weiterbildung, (Engineers and recurrent education) Weinheim (Beltz) 1978, p.30.

This picture has changed considerably; in the main, four movements have contributed toward a trend of rising unemployment of graduates: (1) the continued and still continuing supply of large and rising numbers of graduates; (2) imbalances in the age-pyramid of the civil service, that so far has employed about two-thirds of the graduates and can no longer expand but will rather have to reduce the number of persons newly employed in branches such as the school system, because of (3) the middle-range demographic prospects; and (4) the steep recession of the last years. The thrust of the rising supply and weakening demand will not be counteracted effectively by demand effects engendered by the large-scale modernization and restructuration of the economy that is underway, even if it may help to keep graduate unemployment within bounds, because the needed supply for fields such as electronics, computer science, mechanical engineering, business administration and the like is flowing in sufficient numbers.

We have computed data on employment-seeking graduates and numbers of positions offered over the last ten years. They show (1) widely differing ratios among the graduates of different fields of study, (2) a marked overall cyclical effect for several groups of graduates, and (3) a general deterioration of the situation for graduate employment (Table 15).

Compared with the number of unemployed in the Federal Republic of Germany in general, the number of unemployed graduates grew more slowly until the end of the seventies (Figure 14), but with the advent of the eighties this pattern has reversed. It is graduate unemployment that grows faster now than unemployment in general, even if their rate of unemployment remains lower than that of the labour force in general.

Looking at the unemployment rates, it is nevertheless an advantage to have a higher-education degree instead of being a qualified worker or possessing no formal qualification at all. The only groups that have fared better, so far, are the technicians and groups with comparable formal education (Table 16).

But if the growth of graduate unemployment continues as it is likely to do, even if more and more students choose subjects such as economics, administration and engineering this will not diminish the growth of unemployment, let alone reduce the number of unemployed graduates, because even those groups of graduates whose number of unemployed rose and fell with the movements of the business cycle until 1981 now begin to show a pattern similar to that of the teachers (see Figure 11).

In 1980 40 per cent of the unemployed university graduates and more than 50 per cent of the unemployed college graduates were under 30 years old, which means that recent graduates are

Table 15. Graduate unemployment by field of study, Federal Republic of Germany: ratios of employment-seeking graduates and positions offered

Branch \ Year	1974	1976	1978	1980	1983*
Engineers	1.33	1.85	0.81	0.75	6.02
Scientists	1.73	2.81	1.77	3.00	19.10
Health services	0.64	0.83	0.73	0.45	2.80
Social work	0.53	1.37	1.73	5.47	44.85
Business administration	1.63	1.55	0.86	1.32	4.10
Teachers, economists, jurists	2.27	3.25	2.08	7.96	49.17
Agronomists	2.00	3.00	2.42	10.90	58.10
Total	1.25	1.91	1.18	2.04	12.00

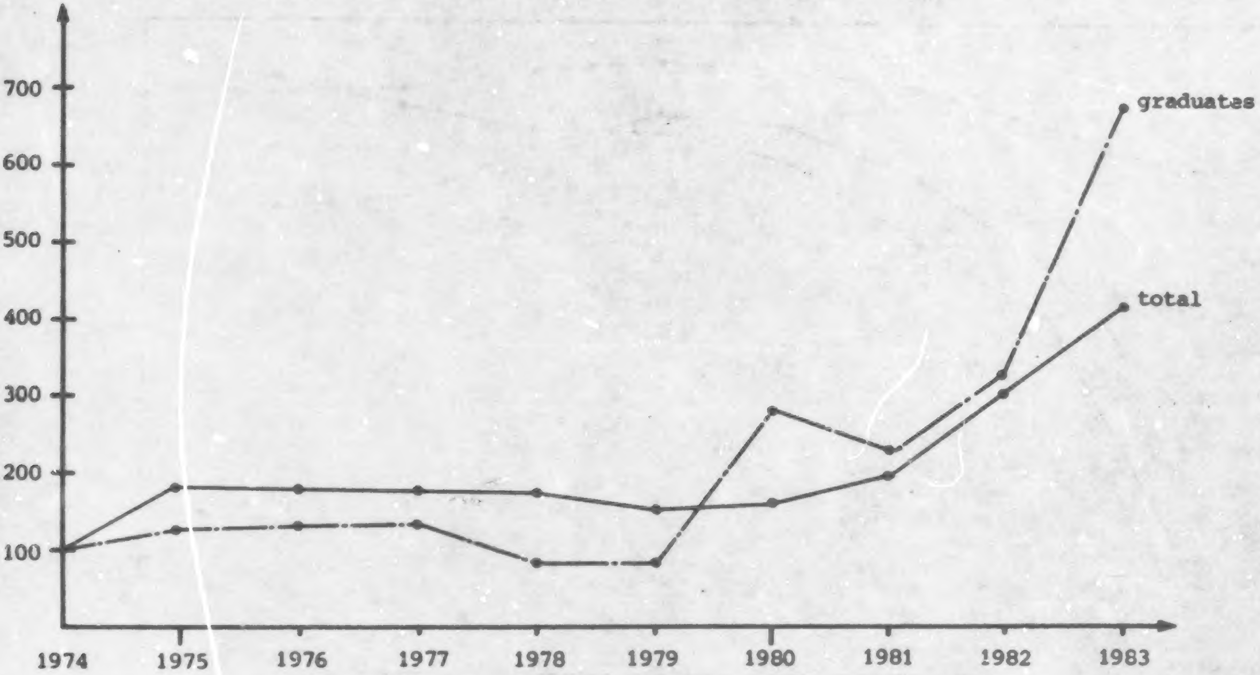
Source: Amtliche Nachrichten der Bundesanstalt für Arbeit, 1975-1983.

* preliminary results

Table 16. Unemployment rates of different qualification groups, Federal Republic of Germany

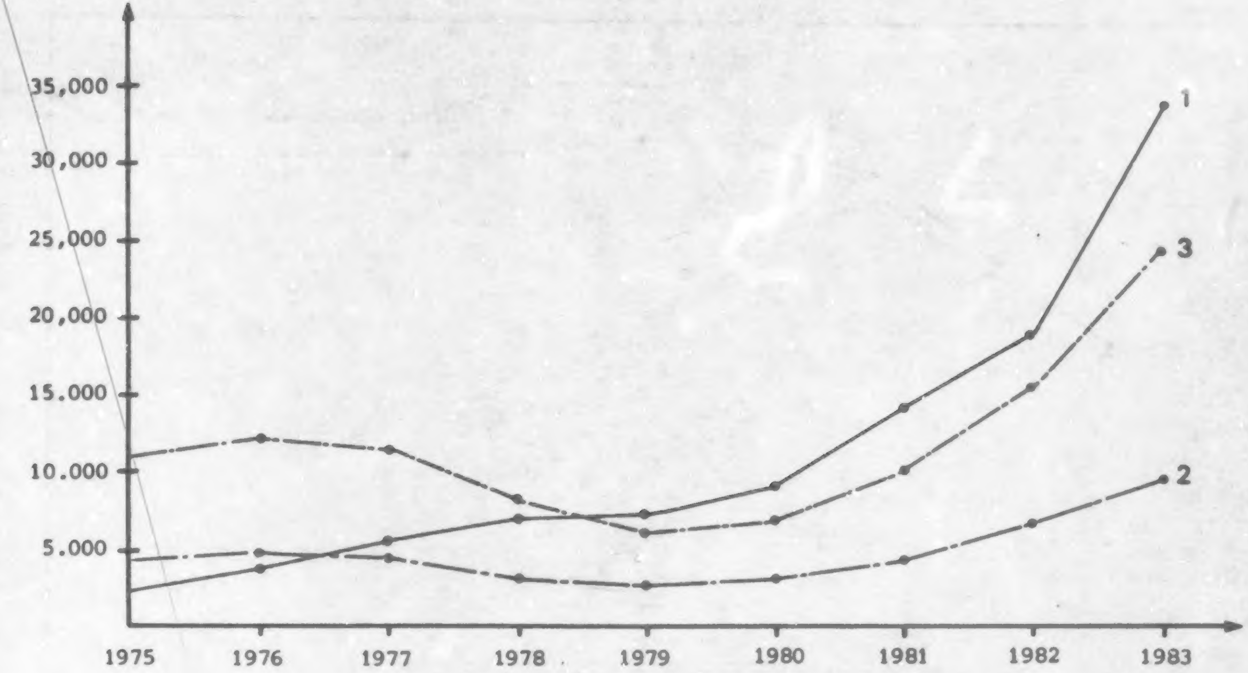
Year Qualification	1974	1976	1978	1980	1982
No formal qualification	3.7	5.6	5.7	6.0	13.4
Qualified worker (3 years of occupational education)	1.7	3.1	2.8	2.4	5.2
Technicial or equivalent education	1.0	2.7	2.4	1.8	2.9
College (Fachhochschule)	2.2	3.3	2.4	2.0	3.6
University	0.9	1.8	1.8	2.1	3.6
Total	2.4	4.0	3.8	3.4	7.2

Figure 14. Development of unemployment in general and development of graduate unemployment, Federal Republic of Germany (indexed numbers)



Source: Amtliche Nachrichten der Bundesanstalt für Arbeit, 1975-1983.

Figure 15. Number of unemployed teachers(1), business administrators(2) and engineers(3): Three patterns of development



those most affected.[1]

A similar trend can be observed when looking at the stability of employment, it is mostly the young graduates who suffer from unstable and ill-remunerated employment - especially in the civil service.[2]

This consideration of employment stability leads directly to questions of adequacy and inadequacy of graduate employment. At the beginning of this section reference was made to the well-known difficulty of relating the notion of under-employment to the level and speciality of education a person has attained: such judgements must be carefully formulated with respect to the phenomena meant and to the criteria applied, because (a) they are likely to reflect a past situation that no longer exists or, even worse, may represent a favourable image of this past situation only; (b) they are as likely to reflect ideology or para-political verbiage in the interest of certain groups as to reflect accurate knowledge, (c) adequacy of employment relates to a multitude of dimensions, as we learn from the Federal Republic of Germany report.[3]

In addition to these three qualifiers of the notion of adequacy of employment, the conception of close correspondence between features of (higher) education and features of employment of a certain group of manpower, beyond relationships externally set and enforced politically may be questioned. This applies equally well to the adequacy of certain types of education and curricula for certain fields of employment. Optimal relations - and the notion of adequacy implies the one of optimum - must be rather the exception than the rule, given the many factors involved in these relations. Of course there are situations where purported inadequacies and imbalances are more acutely felt. There is no difficulty, for example, in realizing that it is inadequate to leave persons unemployed as long as their work could be useful, deliberately to employ them in positions totally unrelated in their specific field of study, even at the beginning of their employment as graduates. But in many cases enough heterogeneity in the employment of graduates of a given field of study may be observed to throw doubt upon sweeping descriptions of adequate or inadequate employment.

---

[1] Tessaring, M."Arbeitslosigkeit, Verbleib und Beschäftigungsmöglichkeiten der Hochschulabsolventen"(Employment, unemployment and possibilities of employment for graduates). Mitteilungen aus der Arbeitsmarkt- und Berufsforschung 1981; p.398.

[2] Lörcher, K.,"Die Verbreitung von Zeitarbeitsverträgen im öffentlichen Dienst"(The occurence of time-based employment in the public service). Mitteilungen aus der Arbeitsmarkt- und Berufsforschung 1982; p.58 ff.

[3] see sub-sections 5.2.5 and 5.2.6 especially of the Federal Republic of Germany report.

Now let us see by what criteria employment of higher-education graduates may be regarded as being adequate or not. There are many dimensions listed in the Federal Republic of Germany report; briefly, they can be summarized as: (i) content of tasks, (ii) career paths, (iii) employment security, (iv) salary, (v) reduced working hours.

Looking at the two reports and at additional literature, all these criteria are mentioned, but with different emphasis. In the Soviet Union it seems that adequacy of employment is most heatedly debated with respect to content of tasks and career paths, while in the Federal Republic of Germany it is more or less all five dimensions that are deemed important, but their importance may vary by sector of employment. In the public sector, for example, the employment of social workers or of teachers is precarious for newcomers in that the conditions of employment as regards the number of hours, employment security and initial grading on the salary scale have deteriorated; therefore, compared to newcomers in the years before, a growing number of them are underemployed (if employed at all), and the probation period before they receive an established position as regular employees or civil servants may also be longer. In private industry these criteria do not play an important rôle, as far as we know; it seems, content of tasks and career paths are the two most important criteria in which changes may have taken place, with employment security coming next, while salaries, so far, have not been affected in any substantial way: within the firms there exist neat hierarchies of income an educational certificate is an important criterion of salary grading. Research cited in the Federal Republic of Germany report clearly shows that it is remunerative to study at a university instead of studying at a college or not studying at all but getting a vocational education. Our own research on the recruitment of graduates of higher education by large firms confirms these results.[1]

It seems most useful in the present context to concentrate on content of tasks, because this criterion is the most immediate and characteristic one that applies for the employment situation of graduates in both countries. With respect to content of tasks, inadequacy in relation to education or qualification of job incumbents may be seen on a "horizontal" as well as on a "vertical" dimension. To start with the horizontal dimension a job may require academic qualifications in a particular field, but the person employed may have been educated in another field of higher education than that required. To fill the position at all, the person in question must have some qualifications in order to carry out some of the tasks required, and he or she will acquire some more qualifications on the job or in further education. The situation is different when the person has studied in an adjacent field and when there is considerable overlap between different specialities, as with economics and business administration in the Federal Republic of Germany, for example, and graduates of either field may be substituted over quite a number of positions and tasks. It is situations like these that make the problem of horizontal inadequacy one of minor importance only. It may become more important if substitution is attempted among engineers of different specialities, since their work tasks are very specialized, or if substitution of an economist for an engineer were attempted (it seems to work the other way round, though, at least in some departments of an enterprise).

---

[1] Buttgereit, M., Holtkamp, R., Teichler, U., Zur Verwendung von Zertifikaten bei der Rekrutierung von Hochschulabsolventen im privatwirtschaftlichen Bereich, project report Kassel 1983 (Wissenschaftliches Zentrum für Berufs- und Hochschulforschung). to be published as Hochschulzertifikate in der betrieblichen Einstellungspraxis (Higher education certificates and recruitment in private firms), Bonn 1984.

On the whole, there seems to be quite a considerable margin within which horizontal substitution may occur without being considered to result in inadequate employment. This certainly applies to the Federal Republic of Germany, as we know from our own research, but it seems to apply to the situation in the Soviet Union as well, if we judge the results in Table 6 of the USSR report correctly, and if the situation since the mid-sixties has not changed fundamentally; we find that, side by side the reduction of the vertical gap between requirements and persons educated to fulfill them, a growth in the share of the category of "other specialists" occurs. As we know that there are many narrowly conceived curricula in Soviet higher education there may be good possibilities for transfer, once training on the job is feasible. Reference is made to only one mismatch, namely that there are too many engineers working as managers or economists.

The situation seems to be quite different with respect to employment of non-graduates in positions normally considered to require graduate qualifications or, and this is more prevalent now, with respect to employment of graduates on tasks which could equally well be carried out with vocational qualifications. It is vertical substitution in both ways that plays the greatest rôle when inadequacies of employment are discussed.

For many years there was massive substitution of engineers and technicians by 'practitioners' (as there must have been of other graduates, in the teaching profession for example) in order to fill positions at all. Even though the number of "fully qualified engineers working in the economy" rose five and half times between 1941 and 1965 and nearly three and a half times in the sole period between 1955 and 1965 (!), this did not suffice to satisfy the demands of the Soviet economy, as is clearly shown by Table 6 of the USSR report. From the information given in this table only a minority of posts for engineers and technicians could be filled by suitably educated persons in 1955 (37.3 per cent), while 7.5 per cent were filled by other specialists and the majority had to be manned by "practitioners", i.e. experienced workers. By 1960 this situation was greatly improved, according to Soviet standards, as the share of practitioners fell to 17.4 per cent and the share of engineers and technicians rose to 67.6 per cent.

In the USSR the quantitative problems of specialist supply for the economy have by now largely been solved.[1] In 1977 most of the posts for engineers had already been filled; compared to the situation in 1966, as we see from Table 27, only technicians were still seriously lacking. Large numbers of graduates added to the labour force each year, courses by correspondance and evening courses taken by 50 per cent of the younger practitioners in specialists' posts, and "the use of intensive methods in the economy", which means large-scale reorganization and rationalizations in management, helped to solve the long-standing problem of quantitative supply of specialists, at least for industry and construction. The authors of the USSR report speak of the necessity "to check the authenticity of requests for specialists" and "to give more prestige to the work of an engineer."[2] This is a clear sign that engineers are employed in positions where their levels of qualification are, by official standards at least, not fully justified. Other Soviet authors such as Kalinkin state that half the graduates from agricultural colleges are in positions that are "rather unrelated to their specific qualifications; the same must be said about the situation of the young teachers."[3] Ušakov relates that in 1975 6 per cent of the higher education graduates and 32 per cent of the graduates of secondary specialized education were employed in positions described as positions for graduates of vocational education.[4] Rjabuškin reports from a study in the Gorki region, chosen as a representative region, that between the sixties and the seventies the number of workers with low qualifications decreased much faster than the number of corresponding posts, and the number of positions with high qualification requirements was only half as large as the number of highly qualified workers.[1]

---

[1] "It is foreseen that for the next few years, all posts for engineers and technicians will be filled by qualified specialists for, at the moment, nearly half of the 'practitioners' doing these jobs are older workers, who will shortly retire and because among the practitioners under 40 years of age, every second person is studying in a VUZ or in a Technicum." (USSR report, p.64).

[2] Ibid, p.91.

[3] Kalinkin, E. Vuz, diploma, chozračet, Pravda 6th January 1979, p.3.(cited after Novikov,L. Hochschulen in der Soviet-Union, (Higher education in the Soviet Union), Weinheim (Beltz) 1981; p.203.

[4] Ušakov, G. Šuruev, A.S. Planirovanie i financirovanie podgotovki specialistov, Moscow, 1980; p.156 (cited after Glowka, D. Einführung in die Diskussion über Hochschulplanung in der USSR, (On the discussion about planning of higher education in the USSR), Mscr. Münster/Kassel 1983).

On the other hand, there are still a number of positions in other sectors (e.g. teaching in countryside schools) that are initially filled by non-specialists even today, because the persons assigned to these posts choose other positions in urban areas and thereby their planned assignment:

"A proportion of the graduates of higher education find ways to circumvent planned assignments. For example, it is no secret that 34 per cent of teachers do not have any higher education; the majority of them are working in the countryside. At the same time, many teaching graduates find their way into the towns and work in positions that often are quite remote from their acquired profession. A similar situation is created in other branches of the economy as well."[2]

The causes of downward or upward substitution (as in the case of the countryside teaching posts) are manifold. The Soviet authors quoted above point to the investment policies and work organization of the enterprises, who offer too few positions for highly qualified manpower, and to the educational system which by its structure and, especially, because of the universalization of general secondary education, gears too many youngsters towards higher education instead of leading them toward the attainment of a vocational qualification. Differences of attraction among regions and between town and countryside may considerably influence the distribution of graduates, creating a shortage here, and a surplus there, despite efforts to control regional mobility. Obviously, these developments are regarded simply as "misallocations" and, accordingly, as an unsatisfactory return on educational investments. We found no reference in the literature indicating that these inadequacies are necessarily seen as signals for adjustments to straighten out the worst imbalances that persist or recur, since they cannot be foreseen sufficiently in advance or cannot be controlled.

In the Federal Republic of Germany there are similar problems of substitution to those in the Soviet Union. But they do not have the same order of magnitude: instead, absorption problems in the form of outright unemployment prevail (see above). In addition to unemployment, there are specific phenomena of occasional and short-time employment and quasi-employment, where graduates are employed without being registered as such with the social security. These jobs may be adequate with respect to content of tasks, but in all other aspects they are obviously not.[1]

---

[1] Rjabuškin, T.V. Pokazateli social 'nogo rabočego klassa, in Sociologičeskie issledovanija 1980, p.19. (cited after Pietsch, A.-J. Reaktionen im Ausbildungs -und Beschäfigungssystem auf Probleme der Bildungexpansion in der DDR und der USSR, (Reactions to problems of educational expansion in the educational and employment systems of the GDR and the USSR) Mscr. München 1982, p.18).

[2] Panferova, N."Itak, izbytok ili nechvatka?"Literaturnaja gazeta 1977/47; p.13 (cited after Novikov, L. 1981, op.cit. p.80).

In spite of the different order of magnitude, problems of downward substitution are not uniformly deplored or condemned. There are, of course, voices which rule out any downward substitution, because turbulences in organizational division of labour, with corresponding consequences of work dissatisfaction, demotivation and productivity losses, are predicted. These voices sound similar to those quoted above from the Soviet Union. They cannot be ignored, but they should not be exaggerated. as there is not only downward substitution of lower-echelon specialists and vocationally trained workers but an upgrading of these jobs as well, because of changing qualification requirements under the impact of widespread and thoroughgoing technical, market, and organizational changes.

In this particular research project we heard not only the traditional opinions, but also several indications of upgrading effects for positions hitherto manned by persons having a vocational education, in the sense that the whole job was done with a different approach and more efficiently.[2] It would be difficult in these cases to speak of mismatch between persons and tasks. This is even more difficult in relation to completely new fields of needs and demand for higher qualified manpower or to new fields of graduate employment, self-employment included.[3] So, all in all, more flexibility may exist in the employment of graduates than has yet been realized. The large supply of graduates spurs public discussions of work organization and the division of labour; furthermore, it questions strategies of investment and the dichtomy between manual and intellectual labour (especially in the Soviet Union, it would seem); and lastly, it brings squarely to the fore questions of admission to education which point in the long run to new kinds of differentiation in the overall educational system (sabbaticals for adult workers is an important aspect in relation to these movements).

---

[1] See the contribution by Tessaring, M.,"Verbleib und Beschäftigungspotentiale von Hochschulabsolventen," p.20 ff, and the one by Schlegelmilch, C., "Grauzonen" des sozialen Verbleibs von Hochschulabsolventen als Forschungsproblem, p.48 ff. in Hochschulexpansion und Arbeitsmarkt, Beiträge zur Arbeitsmarkt- und Berufsforschung No.77. Nürnberg, 1983.

[2] See Ch. 6.4 of the Federal Republic of Germany report; see further Vonderach, G.,"Die neuen Selbständigen"(The new self-employed) in: Mitteilungen aus der Arbeitsmarkt- und Berufsforschung 1980, p.153 ff.

[3] See also the results of a study on the employment of three college graduate cohorts in Kaiser, M./Jelitto, R./Otto, M./Schwarz, U., Berufliche Integration von Fachhochschulabsolventen (Occupational Integration of Fachhochschule - graduates), where it is shown that 13 per cent of these college graduates filled posts that were held by persons with vocational training before (p.95).

3. The place of highly qualified manpower in the division of labour

If one looks at the sectorial development in employment, with still quite a high percentage of persons working in the primary sector in the Soviet Union (see Figure 8), the share of graduates of higher education in the total active population seems considerably higher than in the Federal Republic of Germany. Accordingly, it might have been expected that concern for this state of affairs would develop earlier than by the end of the seventies. Conversely, if the situation of graduate employment in the Soviet Union is chosen as the yardstick, there should be still an unsatisfied demand for graduates in many industrial and service branches in the Federal Republic of Germany.

Why did the situation turn out so different from what was expected? Because, some authors say, characteristic differences in the educational system of the two countries, in the system of societal and organizational division of labour and in the complex interdependence between the educational system and the division of labour (that may go back to the beginnings of large-scale industrialization and some of its initial conditions) lead to different absorptive capacities of national economies for graduates of higher education and to different shares of graduates in the active population.[1] Consequently, the occurrence or introduction of massive changes either in the division of labour or in the educational system will lead of necessity to wide-ranging repercussions in the other, will change the interdependence between education and employment, and will provoke further changes in that system in which changes have been initiated. This means, inter alia, for the organizational division of labour that it does not depend only on kind and level of technological equipment, but also on the 'output' of the educational system that is available in a certain period of time as well.

---

[1] This approach has been convincingly introduced by Lutz, B., "Bildungssystem und Beschäftigungsstruktur in Deutschland und Frankreich" (Educational system and the structure of employment in Germany and in France) in : Mendius, H.-G. et al., Betrieb-Arbeitsmarkt-Qualifikation, Frankfurt (aspekteverlag) 1976; 83-151. It has been applied in a four-country comparison by Pietsch, A.-J. Die Interdependenz von Qualifikationsbedarf und Arbeitsorganisation untersucht am Beispiel der Sowjetunion im Vergleich mit Frankreich, der Bundesrepublik Deutschland und der Deutschen Demokratischen Republik (The interdependence of qualification-demand and work organisation). Osteuropa Institut München 1980, working paper No.63. This section relies heavily on the works by Lutz and Pietsch.

To explain the consequences of this approach for the perception of past and possible future developments in the two countries, a first look will be cast at the established systems of division of labour, and second, at the structure of manpower supply. The third step will lead to a consideration of the initial situation, at the beginning of large-scale industrialization in the two countries. Possible future developments will be dealt with in the concluding chapter.

(1) Even if one concedes a higher relative demand for graduates in the Soviet Union as a result of central planning, accountability and control of the economy(which means that many tasks for highly qualified manpower are absent or organized differently in the Federal Republic of Germany), this still leaves unexplained the high proportion of graduates, given the present development in the USSR.[1] The same goes for possible underemployment of highly qualified manpower in the Soviet Union as effects of a system that regulates the salary and the bonuses of leading managers by the number of persons employed in their enterprise. Instead, there must be central features of the organization of production and management (in the wider sense) that demand a higher rate of graduates and of technicians in the Soviet Union compared to the situation in the Federal Republic of Germany. These are to be found in the highly specialized structure of Soviet enterprises. Thus for example, service functions for production are structured as separate departments, such as maintenance and repairs, transportation, technical control and fitting of machines and equipment. These departments are structured

---

[1] One should bear in mind that the number of admissions to higher education, and thereby the number of graduates, is strictly regulated in the USSR. So even if one may concede that some of the supply of graduates results from concessions to social demand, given the prestige accorded to higher education in the USSR by the authorities, the bulk of the number of graduates is the result of a specific policy. Furthermore, the consequences of the universalization of general secondary education led to the opening of a different avenue, i.e. the establishment of vocational and technical schools on a new basis, leading to higher education as well.

hierarchically with line managers and staff; they work out detailed rules and regulations to guide the working behaviour of the workers in the immediate production. It can be shown not only in the case of the USSR, but also, for example, in the case of France that this way of structuring work organizations creates a high demand for specialists, many graduates of higher education included[1], and some of them may be needed for special co-ordination of these interlaced hierarchies. Another reason for the existence of steep hierarchies may lie in the functional exigency for better integration of talented specialists, graduates of higher education or other, into the enterprise by offering chances for promotion, inciting them by this means to learn the ways of the organization and to be motivated to do their work efficiently, thus obviating the absenteeism or fluctuation which must have been quite common as long as specialists were a relatively rare species of manpower.

What can be seen with regard to the management of industrial organization for immediate production applies to the organization of research and development in relation to industrial innovations as well: most of R and D is organized externally to the enterprises in separate Academy institutes or institutes of branch ministries. As these institutes often know too little of an enterprise's specific tasks and problems, they will develop solutions that may not always correspond to the needs of the enterprise.[2] This separation of most of R and D from production leads to a higher demand of graduates than, for example, in the United States, while the time needed to introduce industrial innovations is longer. Further, research and development institutes showed steep hierarchies, at least in the sixties, which also generate a higher demand for graduates.[3]

---

[1] Lutz, op.cit. 1976, had compared industrial organizations in the same branch with the same production apparatus and the same product lines both in the Federal Republic of Germany and in France, and he could demonstrate that by different organizational structures - the French works having the more specialized and formalized structure - differences in the demand for graduates result: the French organisations need more cadres and more graduates among them, than the corresponding organizations in the Federal Republic of Germany. Nevertheless, the French enterprises were competitive with their products - it is the workers who got paid less.

[2] Pietsch, A.-J. 1980 op.cit p.13. refers to an older study which states that 40 per cent of the designers in the enterprises work to correct and specify solutions proposed by external institutes (see Voprosy èkonomiki planirovanija naučnych issledovanij, Moscow 1968: p.69),

[3] Kissel, J.I. Organizacija truda v issledovatel' skych i projektnych učreždeniach, Moscow, 1969, p.173 f.

Compared to the Soviet model, industrial organization in the Federal Republic of Germany is less specialized and formalized, first-line managers have more responsibilities, and qualified workers have broader, less repetitive tasks than seems to be the case in the Soviet Union. Moreover, most research and development is either integrated (at least in the big firms) or is contracted out directly to research institutes at universities, making for short cuts between producers and utilizers of knowledge.

(2) This is not to say, of course, that on the whole Soviet enterprises work less productively, ceteris paribus; one could not judge this question decisively anyway, with the information at hand. Their model of organization may be quite effective, given the supply of manpower available. In fact, if the supply of manpower for posts in the immediate production and in related departments consists largely of persons having had only little vocational education, it is rational to have narrow work tasks for them so that they can start working after a short phase of learning on the job; and it is rational, too, to have these tasks narrowly defined in order to ensure orderly work flow and the realization of production goals. This applies especially to mass production. Having to employ people without any substantial vocational education and establishing this seemingly rigid type of work organization means, on the other hand, that many specialists have to be employed to keep this organization alive. So, as a rule, one has to look at the total labour force if one wants to know more about the employment of graduates.

The type of industrial organization prevailing in the Federal Republic of Germany (except in mass and large-series production) can be run effectively only if many of the workers in the immediate production can be relied upon as workers who know the type of tasks they are assigned to, who can handle unusual situations and who have internalized craft or industrial discipline.

There are workers with extended vocational training in the Soviet Union as well; since 1975 vocational schools of a new type have been established for many occupations and their certificates allow the holders to compete for admission to higher education, so the character of the older vocational schools as a cul-de-sac is avoided. But it will take time for their impact to be really felt. It remains to be seen, when workers qualified by this type of school encounter difficulties of employment, if Soviet industrial organization will be left unchanged. A decisive difference between the situation in the Soviet Union and in the Federal Republic of Germany will remain even if this type of vocational education becomes dominant in the former; it consists in the educational activity (apprenticeship; special workshops and pedagogical personnel for the apprentices) of the firms, that is far more important than the public vocational schools. In the Soviet firms this kind of educational activity seems to be the exception, not the rule.

So far the old pattern of employment prevails in the Soviet Union, leading to a large and still rising demand for graduates of higher education, on the assumption - questioned by some that their qualifications make them more flexible than other categories of manpower. And their salary is not much, if at all, higher than that of a qualified worker.

The authors of the USSR report point to the fact that in 1977 the demand for engineers exceeded the demand for technicians. But this large demand will have to be counteracted, and it already is counteracted on several levels because of a general shortage of manpower in posts for skilled manual labour.[1] So far, the early targets set for the ratio between engineers and technicians have never been attained. The desired ratio given in the USSR report was 1:3 or even 1:4, but the best approximation seems to have been 10:25.[2] But to change these and other phenomena will mean introducing changes both in education and in the pattern of the industrial division of labour, because the present situation is the result of mutual adjustment of the education system and the employers.

---

[1] See for example USSR report, p.55. we shall consider these and other questions relating to future developments in the concluding chapter.

[2] p.64 of the USSR report. My own computation based on the official data (given in Narodnoe chozjastvo 1980, p.368) gives ratios between engineers and technicians of 10:11 (1941), 10:18 (1965) and 10:16 in 1980.

(in 1000)	1941	1965	1970	1975	1980
Engineers	295	1 631	2 486	3 683	4 914
Technicians	324	2 887	4 333	6 093	7 731
Ratio	1:1.1	1:1.8	1:1.7	1:1.7	1:1.6

(3) To understand the differences of manpower utilization and of the pattern of interdependence between education and employment in the two countries, it is necessary to understand the situation that existed at the beginning of industrialization in respect of the educational facilities available and of the qualification of manpower for posts in industrial production. This situation resulted in solutions that even today structure and stabilize relevant features of both education and employment in the two countries - graduate employment included. This is somewhat surprising in view of the fact that drastic innovations have taken place in industry and in other sections of the economy in the period since the initiation of large-scale industrialization. But general solutions of this nature seem to be long-lasting. Concerning the case of the Federal Republic of Germany the situation in question lies in the period of Imperial Germany and before. Besides basic qualifications in reading, writing and arithmetic there was no preparation of the young generation for industrial work. There were no vocational schools, and the whole system of education, higher education especially, was geared to the manpower demands of the civil and military services. Technical educcation was established only late. That is why the young industrial firms at that time had to organize vocational education in order to get the manpower they wanted. They turned to the still existing model of craft education, which was enriched and complemented by vocational schools, organized at first by the firms and taken over by the state in the end.

For the future employment of graduates of higher education in industry it was decisive that a large proportion of the engineers developed from the class of qualified workers in industry.[1] Up to the sixties, a completed apprenticeship resulted in a valid certificate for admission to an engineering college; in other words, the public system of education played an auxiliary rôle only, and was largely controlled by industry afterwards.

The craft and the industrial type of apprenticeship produced - and, in modified form, still produce - a type of qualified worker who is disciplined, feels responsible for his work and is well-versed in his speciality, so long as it incorporates the technical changes and is organized well. As it served as a springboard for intermediate higher education (that is, the German speciality of engineering education) it was the common ground both for workers, for engineers and for part of the management; this, whatever its defects, may be an important aspect of industrial functioning up to the present time.

---

[1] Only few jurists and economists worked in industry at that time.

The apprenticeship system was generalized quite quickly beyond crafts and industries, and can be found in practically every branch or employment, even in parts of public administration. Now, it has even gained some popularity among youngsters having passed their Abitur (which entitles them to admission to higher education), partly (as in banking) because an appropriate apprenticeship gives them better employment opportunities after their graduation from the university.

For the Soviet Union the decisive period is to be situated in the nineteen twenties and thirties. The programme of accelerated industrialization had practically to be started from scratch. Most of the people coming to work in the factories had a rural background with no experience of industrial work, and many of them were even illitetate.

As the state was organizer both of the economy and of education, a conscious political decision about their respective rôles in the qualification of the new work force was possible.

In this historical situation, and with a strong commitment to the future, it must have seemed an anachronism to rely on pre-capitalist forms of craft apprenticeship; on the other hand, it seemed too costly and time-consuming to run large programmes of intensive vocational education both for adult workers and for young ones without any infrastructural resources at hand. So the decision was made in favour of a solution which allowed a minimization of educational effort for most of the workers involved. Parallel to this the establishment of a general education with compulsory primary education took place for the whole country and the enlargement of higher education and its restructuration were organized rapidly. Instead of the university, the specialized institutes became the dominant type of institution, governed by branch ministries to whom they became attached directly. This reorganization and expansion defined the place of higher education in the economic and political strategies both for the overall development of the Soviet Union and for the development of branches and geographic regions.

Instead of the university, the specialized institutes became the dominant type of institution, governed by branch ministries to whom they became attached directly. This reorganization and expansion defined the place of higher education in the economic and political strategies both for the overall development of the Soviet Union and for the development of branches and geographic regions.

These initial choices and their realization are still influential in the stabilization of a self-reinforcing relationship between the system of education and the division of labour.

Because of the demographic problems already mentioned, and because of the "educational drift" which results in an imbalance between the number of highly qualified persons and the number of work places available for them, this mutual reinforcement may have deteriorated to a point where the introduction of modifications on both sides will be come necessary, i.e. breaking up the unitary hierarchy in education and modifying the strict division between manual and intellectual labour.

IV. SCOPE AND PROCEDURES OF EDUCATIONAL PLANNING IN THE TWO COUNTRIES

The two main questions to be dealt with in this Section are; What is planned for higher education? How is it done? Other questions and problems related to the planning of higher education are taken up in connection with the "what" and "how" of higher education planning, for example:

- what are the specific qualities of planning in contrast to political decision-making and administrative action ?
- what are the initiating conditions that make planning advisable ?
- how do planning targets relate to social values and long-ranging political aims ?
- who are the actors in planning and how is planning ratified ?
- what is the data-base for planning in the two countries ?
- of what use is planning? (Successes, failures, unanticipated consequences)

These questions and the problems they raise will be dealt with mainly in passing, however, in view of the space available[1].

1. The scope of educational planning

(1) Looking at the Soviet Union first, planning of higher education is comprehensive, that is, it is directed to the content, the personnel and physical capacities, and the qualities of teaching and research of higher education, and it is directed to the entry of students and to their graduation. Furthermore, planning of higher education in the Soviet Union is interwoven with planning of other sectors of society, most notably with economic planning. In so far as higher education is seen as

---

[1] For a discussion of some of these issues see Fulton, O. Gordon, A. Williams, G., Higher education and manpower planning. A comparative study of planned and market economies. Geneva (ILO), 1982.

a service of strategie relevance for the societal and economic development of the Soviet Union, its planning can even be considered a part of economic planning, with regard to the manpower requirements of the various sectors of employment where highly qualified manpower may be utilized, and with regard to its supply. Third, planning of higher education in the Soviet Union is centralized, which means that there exists a nationwide planning agency that collects and processes all the information deemed necessary for its purposes and may count on the assistance of every establishment of higher education and every employment organization (enterprise or service agency) through their administrative and supervisory organizations (ministries of education in all the republics, branch ministries). It means also that all the actors in higher education, and those actors who are related directly to it as employers of graduates, are institutionally integrated into the processes of planning.

The central planning agency draws up the plans for higher education on the basis of the preparations made by local and republic levels, but each year the plan is evaluated and if necessary changed and modified: approved plans have the force of law in the Soviet Union[1].

Comprehensiveness, interdependence with other planning activities, and centralization all make for a maximum rôle of planning for the sector of higher education, as compared with countries such as the Federal Republic of Germany, and even more with countries such as Canada or the United States.

Therefore, such limitations in educational planning as may exist in the Soviet Union will in general result from:

- inherent problems of planning due to limitations of forecasting, i.e. gnoseological problems such as self-fulfilling or self-destroying prognoses, and methodical problems, such as limitations of the mathematics approach chosen, and general limits of predictability;
- problems of the collection and processing of relevant information;
- problems of integration between the plans for education and those for other sectors of Soviet society, and between plans of different time horizons (short-term, medium-term, long-term);
- repercussions of the existence of planning on the behaviour of different contributors to planning.

---

[1] Sketching some aspects of the Soviet system of planning of higher education , we mainly rely on Ch.5 original report, as well as on Onushkin, V., Some problems in the Planning of Higher Education in the USSR, Paris (Lecture-Discussion Series, No.39) International Institute for Educational Planning) 1969 and on Ivanov, I.V., Skilled Manpower Planning, Forecasting, and Training in the USSR, IIEP/S85/5 - IIEP, 1982.

Scope and procedures of educational planning in the two countries

As may be seen from the two preceding sections, the public authorities must have a great influence on higher education and its course of development in the Federal Republic of Germany, because higher education is publicly run, and nearly two-thirds of all graduates of higher education are working with various public authorities, a lot of them within the system of education. This influence is only slightly countered by the traditions and practice of autonomy of each establishment of higher education ("Hochschulautonomie").

Nevertheless, educational planning in the Federal Republic can be considered only partly comprehensive, moderately interwoven with the planning of other spheres of societal interest at best, and more or less decentralized;

(a) The Federal character of the Republic seems nowhere to be more energetically upheld than in matters of culture and education, higher education included. Divergent developments - if unwanted or considered harmful to the constitutional norm of general uniformity of life conditions in the Federal Republic - can be avoided only by formal agreements among the Länder or between the Federal government and the Länder governments. Besides these basic regulations there are standing commissions of the Länder and of the Federal government and the Länder governments in which daily affairs are dealt with.

(b) Educational planning in the Federal Republic is less comprensive than educational planning in the Soviet Union, for two main reasons: first, admission can be controlled only in part, so student numbers cannot be taken for granted at a specific point in time, nor can certain capacity limits be defined or certain numbers of applicants be forecast. This state of affairs arises from two rulings of the Supreme Court[1], affirming that the certificate of secondary education (Abitur) is still sufficient, with qualifications, for enrolment in a university, and that numerus clausus or other admission regulations may be applied only to the extent that a long-term growth of capacities of higher education could not be justified with respect to other public obligations. All in all, individual rights to education by own choice, as long as basic conditions are met, and free choice of occupation were affirmed thereby. Second, even with public authorities as the main employers of graduates of higher education, a substantial minority of graduates are employed by private firms or self-employed. They form autonomous units of decision for any of their own manpower issues, and there is neither a duty to report on manpower planning, nor (and even less so) an obligation to employ somebody on account of a requirements forecast.

---

[1] See for a short information the literature cited in Section II.3 and Hüfner, K. Köhler, H. Naumann, J., Higher Education and Manpower Planning in the FRG, Geneva/Bucharest (ILO/CEPES), 1977, p. 80.

(c) The interdependence of educational planning with the planning for other spheres of societal interest is only partially achieved, that is on the level of the single Land (state), with respect to regional planning. The general rule, that Federal authorities have to ensure that a uniformity of general conditions of living in the republic be achieved, has not been implemented to justify overall planning.

(2) Ever since the foundation of the Soviet Union planning has been an essential element of its government and its daily administration.

A plan was (and is) looked at as the conscious embodiment of a collective project. In this way, planning is different from both political decision-making and legislation, in that it not only expresses the political aims, but formulates them as realizable goals, sets out the means and resources relevant to the achievement of these goals and lays down a model of action, whereby goal-achievement shall take place within given time-horizons. It differs, too, from administrative action that is in principle timeless, oriented to cases and occasions in the pursuit of its purposes. Planning would be unthinkable, of course, without either political decision-making for its goals and administrative action for the greater part of its execution, but it gives, at least by intent, a new dynamism and consciousness to political volition and action. This is especially so, if the goals of planning are expansive, if they are geared to a rapid development of the whole society or parts of it, and if the plans are of a binding character and are realizable, i.e. not completely voluntaristic. In the Soviet Union educational planning came into existence by the end of the twenties, as part of more general cultural and economic programmes of literacy, of the generalization of primary education of medical services, and of industrialization.

The new organization of higher education along lines of specialization and (co-) administration by branches of industry of most of the colleges and universities was an essential prerequisite of qualitative planning, i.e. the planning and revision of curricula and teaching methods, as well. In these newly formed relationships between higher education and employment, planning functioned as a dynamic means of communication and goal-setting among party, governmental and industrial interests themselves, ensuring the instrumentalization of higher education on a permanent base within the Five-year plans.[1] The definition of curricula came largely from qualification requirements of the employers, taking into consideration definitions coming from developments of the scientific disciplines themselves.

---

[1] Planning cannot be understood properly, we presume, unless, in addition to its official functions, it is seen as a field of mediation or a set of clearing mechanisms as well. This function seems to be prevalent even in countries with systems of partial planning only, such as the FRG and other West European countries.

At present, there are results of curriculum research and of research in qualification requirements available in order to revise curricula and teaching methods, while decisions for quantitative planning are made partly on the basis of results from multiple regression analyses that have the human capital concept as their theoretical rationale[1]. Manpower requirements are specified in terms of more than 500 specialities taught within higher education. As the authors of the USSR-report relate, "requirements are calculated for each sector, production unit, enterprise and establishment, for periods of five and ten years, with yearly revision of the indices."[2] Planning is also related to regional units, and there are plans for each republic, integrated with the sectoral plans. So it is justifiable to characterize Soviet planning as follows: "The demand for highly skilled manpower is the cornerstone of the system of interrelations between the sphere of 'consumption'of specialists and the sphere of their production. Arising as it does in the branches of the economy, this demand determines the activity of higher and specialized secondary education, exerts an influence on it, and is itself influenced by it."[3]

Social or individual demand for higher education is a goal for higher educational planning that is mentioned quite frequently in the Soviet literature on planning. But there will be no additional places in higher education because of individual demand for them. Instead, all its capacities are determined by employment needs. This may be justified, of course; there are many other pressing societal obligations to be fulfilled, and whatever services higher education may render to the economy and to the rest of society, and however remunerative investment in it may eventually prove to be, it has to be financed initially from the economic surplus, and will pay only in the long run. That being so, if it is thought feasible to gear the system of higher education to manpower requirements, and if the development of society is understood as a common "project" that everybody is working for in his place (i.e. the place best suited to his qualifications) problems of social demand will nevertheless arise at two points: at the assessment of applicant's competence, and in the planning for higher education and for the employment of graduates.

---

[1] See USSR-report, p. 105. (original report)

[2] Ibid., p. 109. (original report)

[3] Ivanov, I.V., 1982, p. 35.

With regard to the competence of applicants, faulty assessments may raise the question whether assessment of competence for higher education is reliable in either sense for getting into higher education every young person who is able to study successfully (and for keeping out all those who are not). Further, drop-outs from higher education will have to be given other educational or employment opportunities.

With regard to the accuracy of higher education planning, serious problems will come up if it should fail to reach its targets, or should overreach them, for several periods, creating a chronic shortage or a chronic surplus of graduates, with consequent "misallocation" according to the established goals and criteria of planning themselves.

The first set of problems implies measures of restructuring education in general, by augmentation of counselling efforts, and by improvement of evaluation "techniques and teaching methods. The second set of problems invites not only better methods of information gathering and processing and better methods of planning, but may require a reformulation of the place of planning in the relationships between higher education and units of economic decision, too.

It is clear from the description of the Soviet system of higher education planning that in so far as problems of this nature are perceived new methods are tried out, and the coming years may experience quite a few innovations in the fields mentioned (see Section V).

While the Soviet Union can look back now on more than fifty years of planning for higher education, this kind of activity is of much more recent origin in Germany.

Planning was not practised before the Nazi era, and during that era, higher education was simply reduced to about half of what it had been before, in quantitative terms, not to speak of its moral degradation.

In the first years after the war there was only restitutive planning on a modest scale, effected by the universities themselves in close accord with the occupying forces and the new civil authorities. The amount and the quality of educational planning hardly changed in the first years of the FRG. Only in the mid-fifties did the discussion concerning the promotion of research and of higher education gain enough momentum to result in the creation of an advisory planning agency, the Science Council (Wissenschaftsrat). It consists of representatives of the federal government, of the governments of the Länder (the votes of the Federal authority and of the Länder authorities have equal weight), of scientists who are recommended by the two main organizations of research and research promotion and by the organized lobby of the universities and the Fachhochschulen.

Though its decisions may not bind any of the political authorities (neither the governments participating in the decision-making, nor the Federal and Länder legislators), the advice of the Science Council has had a great influence on the quantitative expansion of higher education in the Federal Republic. The Science Council in effect led the way in several aspects of what may be considered as the nearest possible approach to centralized planning for the input side of higher education (which means planning of buildings and equipment of all kinds, and planning of personnel). It is thanks to this advisory body that we enjoy a relatively reliable data-base for many aspects of higher education; the main task remaining to be fulfilled is now planning for expansion, which was a comparatively easy task until the beginning of the seventies since education, and higher education especially, enjoyed high political priority. Plans for the expansion of higher education were drafted mainly with social demand for higher education in view but were influenced, nevertheless, by a lively concern for public and private manpower requirements, as far as these could be ascertained by forecasting studies.

By the middle of the sixties these planning activities were complemented by independent planning on the level of each Land of the Federation, starting with Baden-Württemberg. Educational planning came into a definitely new phase in 1969 with changes in several articles of the Constitution of the Federal Republic, concerning joint tasks of the Federal and the Länder authorities. These changes gave some influence on educational policy to the Federation.

There are two joint tasks of the Länder and of the Federation directly pertaining to (a) planning for higher education and the promotion of research and (b) the construction of buildings for teaching and research in universities and colleges.

Two new agencies were set up to serve these ends, the Commission for the Planning of Education and the Promotion of Research of the Federation and the Länder (Bund-Länder-Kommission für Bildungsplanung und Forschungsförderung) and the Committee for the Planning of Constructions in Higher Education (Planungsausschuß für den Hochschulbau). The voting powers of the Federation side and the Länder side in these agencies are equal. The Commission is allowed to make recommendations only, even though its members have top responsibility in the execution of educational policies. Its recommendations will be followed only if at least nine of the chiefs of the Länder governments and the Chancellor of the Federal government consent and if they are endorsed by a parliamentary vote in each of the parliaments concerned. The main task of this Commission is long-term and overall educational planning, planning for higher education included.

The Committee for the Planning of Constructions in Higher Education is responsible for the short-term planning and realisation of all kinds of buildings for universities and colleges. Its plans for the coming year have to be included in both the Federal draft budget and the Länder draft budgets. Construction and capital costs are divided evenly between the Land in question and the Federation.

Besides the Science Council, the Bund-Länder-Kommission and the last-named Committee .., planning for higher education takes place in each of the Länder, on the level of each university and college, and on the most elementary level of the single department, as envisaged by the framework law for higher education of 1975. Nearly every university has its own planners now[1].

In spite of the changed setting the Science Council has retained its influence on planning for higher education ; it may be characterized as a sort of go-between agency, mediating between long-term and short-term planning, between far-ranging and general goals on the one hand and specific goals on the other, and between the top bureaucracies, the chief lobbyists for the leading economic and other interests and the representatives of the scientific establishment.

2. Procedures of educational planning

Some more insight into educational planning in each of the two countries may be gained, if we look at planning procedures and at the interplay among the several agencies concerned, even though one can sketch it only in its barest outlines here. Emphasis is laid on the integration of different time horizons in planning, on the generation and processing of specific aims of planning and on the information necessary to realize them. In this context, one of the key problems of planning seems to be the establishment, control, and revision of valid indices or (quantitative) norms - be they student/professor ratios, square metres of floor-space per student, financial norms for constructing university buildings, or the relative number of highly qualified specialists per 1,000 workers, to cite just some examples.

---

[1] Planning within the universities had been promoted by the Volkswagen Foundation, which founded and sponsored a service agency to help universities and colleges to develop their own planning and information-gathering and -processing services. The agency, the Hochschulinformations System, (HIS), is now financed by the Federation and the Länder jointly.

Though its decisions may not bind any of the political authorities (neither the governments participating in the decision-making, nor the Federal and Länder legislators), the advice of the Science Council has had a great influence on the quantitative expansion of higher education in the Federal Republic. The Science Council in effect led the way in several aspects of what may be considered as the nearest possible approach to centralized planning for the input side of higher education (which means planning of buildings and equipment of all kinds, and planning of personnel). It is thanks to this advisory body that we enjoy a relatively reliable data-base for many aspects of higher education; the main task remaining to be fulfilled is now planning for expansion, which was a comparatively easy task until the beginning of the seventies since education, and higher education especially, enjoyed high political priority. Plans for the expansion of higher education were drafted mainly with social demand for higher education in view but were influenced, nevertheless, by a lively concern for public and private manpower requirements, as far as these could be ascertained by forecasting studies.

By the middle of the sixties these planning activities were complemented by independent planning on the level of each Land of the Federation, starting with Baden-Württemberg. Educational planning came into a definitely new phase in 1969 with changes in several articles of the Constitution of the Federal Republic, concerning joint tasks of the Federal and the Länder authorities. These changes gave some influence on educational policy to the Federation.

There are two joint tasks of the Länder and of the Federation directly pertaining to (a) planning for higher education and the promotion of research and (b) the construction of buildings for teaching and research in universities and colleges.

Two new agencies were set up to serve these ends, the Commission for the Planning of Education and the Promotion of Research of the Federation and the Länder (Bund-Länder-Kommission für Bildungsplanung und Forschungsförderung) and the Committee for the Planning of Constructions in Higher Education (Planungsausschuß für den Hochschulbau). The voting powers of the Federation side and the Länder side in these agencies are equal. The Commission is allowed to make recommendations only, even though its members have top responsibility in the execution of educational policies. Its recommendations will be followed only if at least nine of the chiefs of the Länder governments and the Chancellor of the Federal government consent and if they are endorsed by a parliamentary vote in each of the parliaments concerned. The main task of this Commission is long-term and overall educational planning, planning for higher education included.

The Committee for the Planning of Constructions in Higher Education is responsible for the short-term planning and realisation of all kinds of buildings for universities and colleges. Its plans for the coming year have to be included in both the Federal draft budget and the Länder draft budgets. Construction and capital costs are divided evenly between the Land in question and the Federation.

Besides the Science Council, the Bund-Länder-Kommission and the last-named Committee .., planning for higher education takes place in each of the Länder, on the level of each university and college, and on the most elementary level of the single department, as envisaged by the framework law for higher education of 1975. Nearly every university has its own planners now[1].

In spite of the changed setting the Science Council has retained its influence on planning for higher education ; it may be characterized as a sort of go-between agency, mediating between long-term and short-term planning, between far-ranging and general goals on the one hand and specific goals on the other, and between the top bureaucracies, the chief lobbyists for the leading economic and other interests and the representatives of the scientific establishment.

2. Procedures of educational planning

Some more insight into educational planning in each of the two countries may be gained, if we look at planning procedures and at the interplay among the several agencies concerned, even though one can sketch it only in its barest outlines here. Emphasis is laid on the integration of different time horizons in planning, on the generation and processing of specific aims of planning and on the information necessary to realize them. In this context, one of the key problems of planning seems to be the establishment, control, and revision of valid indices or (quantitative) norms - be they student/professor ratios, square metres of floor-space per student, financial norms for constructing university buildings, or the relative number of highly qualified specialists per 1,000 workers, to cite just some examples.

---

[1] Planning within the universities had been promoted by the Volkswagen Foundation, which founded and sponsored a service agency to help universities and colleges to develop their own planning and information-gathering and -processing services. The agency, the Hochschulinformations System, (HIS), is now financed by the Federation and the Länder jointly.

Scope and procedures of educational planning in the two countries

(1) In the Soviet Union there exist plans of various time-ranges which are linked by mechanisms of specification, updating and revision. In their latest shape, dating from a degree issuedin 1978, there are plans in four time-ranges :

- a long-range "programme of scientific and technological progress" spanning twenty years, divided into four five-year periods;
- main options of economic and social development for ten years (two five-year periods), with elaborated indices for every one of the first five years;
- five-year plans from the USSR-level down to the level of the single enterprise or other employer/establishment of higher or secondary specialized education;
- annual plans, (annual assignment plans for young specialists, for example).

As plans for the employment of highly qualified manpower and for their education prior to assignment form an integral part of this planning machinery, so do plans for the development of higher education: there are annual plans for every establishment of higher and secondary specialized education.

The plans for educational establishments comprise qualitative goals, too, i.e. curricular goals, improvements in teaching and in the management of the establishments themselves. These qualitative goals are of great importance, in as much as their attainment has positive consequences for the attainment of quantitative goals as well. This holds true for the number of students graduating out of an age-cohort of new entrants, for example, as far as this number can be influenced by the quality of teaching, thereby reducing the number of drop-outs in specific fields of study[1].

In the Federal Republic of Germany there are three principal ranges of planning, if looked at on a time-scale:

- the Comprehensive Educational Plan issued in 1973 by the Bund-Länder-Kommission (see above) and slightly revised in 1977; this plan covers the period up to 1990;
- four-year plans elaborated by the Committee for the Planning of Constructions in Higher Education;
- annual revisions by the Committee according to the intentions of the Länder, which depend partly on the amount of taxes that can be expected.

The long-range plan gives financial estimates as well, but as these go beyond the jurisdiction of the Federal-Länder financial planning, they cannot exert any obligation on the political authorities. The plan is a framework or guideline, merely demonstrating the good intentions of the Federation and of the Länder.

---

[1] See Ivanov, I.V., Skilled Manpower Planning, Forecasting and Training in the USSR, IIEP, Paris, 1982; p. 14 and p. 199ff; see as well Ch. V. of the original report to the volume.

(2) Turning to the situation in the Soviet Union again an example of the complex interplay in the course of the establishment of a plan - the annual assignment plan for young specialists is given by Ivanov:[1]

- planning starts with the formulation of current demand in the enterprises for a given year (about three years ahead);
- this information is collected by branch ministries and departments in the republics and processed to become part of a republic-wide estimate of specialist demand;
- branch ministries send their estimates to the republic's planning administration;
- republic-wide estimates combining branch- and regionally-oriented estimates are then submitted to the USSR Gosplan, which also receives estimates given by the Union ministries and departments.

The supply-side estimates of the number of graduates for the corresponding year are prepared in much the same way as the demand estimates; the plan is promulgated by taking the same route in reverse. The whole process takes about eighteen months. "The assignment plan is usually confirmed.. one year before graduation .. As a result, the pre-diploma practical work and preparation of the diploma work take place in the enterprises where the graduates are to be employed in the future."[2]

Personal assignments will have to be decided at least four months before graduation.

Similar types of processes, supported by more or less detailed forecasts, legislation and experimental phases for institutional revisions, take place in the case of middle- and long-range planning.

For the Federal Republic of Germany, where manpower planning is practically non-existent, the example taken for a sketch of the process of planning is the planning of constructions for universities and colleges.

As there are relatively few actors involved, and the ambitions of planners are rather modest, planning is relatively straightforward:

- The annual plans by the Committee for the Planning of Constructions in Higher Education start with the statement of goals (together with estimates of costs) of the Länder for the coming year which are collected by the Federal Ministry of Education and Science by 1 March.

---

[1] See Ivanov, I.V. 1982, op.cit. p.24ff.

[2] Ibid, p.26.

- These statements and estimates are handed over to the Science Council for consideration and for recommendations to be issued on 15 April.
- The Science Council's recommendations serve as the factual groundwork for the negotiations of the annual plan in the Committee, which has to issue the plan on 1 July.

The annual plan is set in the frame of a four-year plan[1], which will be more or less revised each year by this annual plan so that consequences resulting from changes in the respective year can be considered for the years to follow.

The recommendations of the Science Council are very detailed on the level of a university's or college's department, and they are based not only on the goals stated by the Land in question but also mainly on the work of sub-commissions, whose members will visit the universities and Fachhochschulen directly every few years if need be, to assess the situation. In fact, it is the Science Council that does most of the preparatory and coordinating work [illegible] the framework-plan and for the annual plans as well.

The Science Council, incidentally, is not restricted to questions of construction, large equipment and schemes for financing them, when it issues recommendations for single establishments of higher education.

(3) Looking at the planning activities in both countries, their respective integration in the time dimension is impressive, especially in the Soviet Union. Even so, "frictions" do occur as a result of innate differences in time-scales between the demand for highly qualified manpower and its supply by higher education, both in terms of quantity and in terms of qualification profile;

- the number of graduates can be known in advance only approximately;
- there are quite a few exceptions to the rules regarding regular assignments, and not every graduate assigned will really fulfill his/her obligations. (see Section III);
- manpower demand estimates three years in advance may prove inadequate, because the situation envisaged when the demand had to be formulated has not materialized, specific requirements could not be foreseen, etc.

With respect to the last named type of differences, Ivanov states that enterprises in the Soviet Union are undermanned by 10 to 15 per cent every year as a result of their own estimates. There are however situations where the opposite occurs, and the authors of the USSR report in this volume mention that enterprises are known to overstate their actual demand.[1]

---

[1] The period of four years has been chosen in order to keep in line with middle-range financial planning of the Federation and the Länder.

There are still other problems that can be held partially in check only by close temporal integration and the integration of planning for different cultural, educational and economic activities. These problems loom quite large in the Soviet literature on planning, and while they are more prominent in Soviet planning they exist in the educational planning of the Federal Republic of Germany as well. They arise from differences of interest that manifest themselves particularly at certain steps in the planning process, and also from the criteria and nomenclature used to describe the goals and objects of planning in the course of planning processes.

In the case of manpower planning, differences of interest in the course of planning manifest themselves acutely at two stages: first, at the stage of demand formulation at the level of the enterprise, and second, at the level of the drawing-up of plans. In a way, it is a more or less silent conflict between two strategies: the planning administration is bound to make use of scarce resources in a way that ensures the functioning of all the organizational units that employ highly qualified manpower at the least possible cost and with the least number of personnel; while the employing organizations ensure that, in the interest of their own production or service goals, they will receive as many highly qualified employees as possible, since highly qualified manpower is a versatile and valuable category of manpower, especially with the given division of labour. This conflict has become quite outspoken, as we have already seen (see Section III) and a major reason for the size of this conflict seems to be that employers are not held accountable for at least some of the cost of higher education of their highly qualified manpower, so far. The fact that demand for highly qualified manpower may be inappropriate from the point of the planning administration may not be readily apparent from the information given by employers, because a classification is used that is outdated and no longer of much validity.

The problem of the classification of occupations is acknowledged both in the USSR report in this volume and by Ivanov. The USSR report states that "the greatest difficulty comes from errors in evaluation based on the nomenclature of posts."[2] Ivanov's criticism is that"the nomenclatures still in use have been established without any thorough scientific analysis of the functions ... of specialists with higher and secondary specialized education."[3]

---

[1] Compare Ivanov, I.V. op.cit, p.26f. and pp.34 and 40; see further USSR original report p.119.

[2] USSR original report in this volume, p.119.

[3] Ivanov, I.V. op.cit. p.4.

It would be a tremendous task to bring nomenclatures closer to reality on the basis of results from appropriate large-scale research, this is a field of scientific research which seems to be relatively neglected, compared to other fields of research in the social sciences, in nearly every country.

There are two other methods for ascertaining the demand for highly qualified manpower that work with established norms ("normative method" and the "saturation norms method").

These methods enable the number of specialists needed to be calculated on the basis of a given workload or in relation to the number of workers in other categories. As with the classification, the application of these norms must overcome the defect of their possible lack of a scientific basis.[1]

These norms may take years before being amended, as we have learned in the case of the engineers/technicians' ratio. In other cases they may gain their own momentum, and they may become a reality created by planning rather than a part of the reality which planning should help to improve. This kind of criticism has been levelled against educational planning in the Federal Republic of Germany and the capacity norms it is following. These norms have been established, too, without valid knowledge about teaching and study realities in the Republic's establishments of higher education. As they have now become a physical reality, they influence in turn what happens in higher education on a silent, everyday basis.

However, the fact that planning and its procedures have to be criticised does not mean that one could do without them. Planning has its own dynamics and consequences; and just as one cannot step out of history as easily as stepping out of a cab, to use Max Weber's dictum, one cannot abolish planning once it has been established. Even though planning may produce rigidities and some deformations, not to plan at all may mean a more or less total denial of political will and intentions.

On the other hand, the cognitive and social prerequisites, the consequences, and the organisation of educational planning have to be constantly reconsidered in order to avoid institutional automatisms and their unwanted rigidities.

Four kinds of problems seem to be at the forefront, whenever planning is debated as a rational social endeavour.

First, there is the problem of the categories within which the objects of planning are understood, counted, and computed. This problem is crucial on the cognitive level, and we have seen that in both countries educational planning has been aborted by ill-adapted and obsolete categories - be they work-place or qualification norms or norms for the planning of university buildings. To keep this problem within bounds, the increased research efforts of several disciplines are necessary to gain a better understanding, better adapted categories, and a more valid and reliable data-base.

---

[1] Ivanov, I.V. op.cit. p.39 and 41.

Second, there is the problem of the length and reliability of the channels of communication between planning agencies and between them and the social fields of educational planning. This problem is to some extent related to the first one, in so far as it may concern non-routine ways of data collection and evaluation of projects; but these aspects remain more or less peripheral compared with basic administrative policies that decide upon the relation between planning and the social fields and organizations that educational planning is supposed to serve, on the one hand, and the relation between government and educational planning on the other.

Third, we have to be aware of what may or may not be amenable to educational planning, and of the possible consequences of planning that does not take account of the goals identified as relevant for planning. If, for example, the demand for highly qualified manpower in a particular narrowly defined speciality has to be forecast several years in advance, no one can be sure that the number of graduates demanded will in fact find employment of the type expected, since in the meantime strategic decisions by employers may have affected the original forecast in such a way that the number or the specific qualification profile of these graduates may no longer be of great use for the employers in question.

Fourth, the processes of planning and their pre-requisites have themselves to be accepted as a field of social action in its own right. The problem here lies with the difficulties of "self-enlightenment", so to speak. This problem may become better understood by research into the processes and conditions of planning which seems as yet to be underdeveloped in the two countries.

These problems demand continuous attention, since they can be solved only in piecemeal fashion.

V. CONTINUITIES AND CHANGES IN HIGHER EDUCATION AND ITS RELATIONS TO EMPLOYMENT IN THE TWO COUNTRIES

This last chapter is meant to serve as a summary of the main features of the comparison between the Soviet Union and the Federal Republic of Germany, to be followed by some concluding remarks about possible changes in the two systems of higher education and their relations to employment.

1. Main results of the comparison

(a) Some general organizational features of higher education and its relations to employment

To begin with, higher education is a public, state-run service in both the Soviet Union and the Federal Republic of Germany. The importance of this common aspect is not apparent, however, since privately run higher education or a mixed system (as in the U.S.A. or in Canada) need not be considered. Both systems of higher education consist of different types of educational establishments. In the Soviet Union there are "specialized institutes", universities and polytechnical universities. In the Federal Republic there are mostly universities, Fachhochschulen and comprehensive universities; apart from these main types of establishment there are schools of arts and music, some schools for teacher training and some theological seminaries. All these schools have university rank, but the number of their students is small compared to student numbers in the main types of establishment.

The system of higher education in the Soviet Union seems to be characterized by the large number of "specialized institutes", while higher education in the FRG is characterized by the multidisciplinary universities which admit about 70% of all new entrants. There is in the FRG, of course, internal differentiation in the teaching of disciplines, and in the elaboration of sub-disciplines, and there are differences in the extent to which large employers' interests are reckoned with at several institutes or departments, but this does not lead to special certificates as it seems to do in the Soviet Union.

Whereas higher education in the FRG is a two-tier system with the Fachhochschulen as the lower and the other establishments as the upper tier, there is no formal hierarchy among the three types of establishments in Soviet higher education. Length of study, for example, depends entirely on the field of study chosen, and not on the type of establishment as in the Federal Republic.

Another difference between the two systems of higher education worth noting lies in the temporal involvement of students: in the Federal Republic nearly all the students (with the exception of those studying at the only correspondence university in Hagen) are studying full-time, in the Soviet Union nearly 40% of the students newly admitted in 1980 follow evening or correspondence courses.

Administration of higher education shows large differences between the two countries, that result directly from the obvious differences between the two states in their political and administrative structures. When higher education was reorganized in the Soviet Union on the basis of far-reaching political cultural and economic goals, in the beginning of the thirties, the great majority of the newly created institutes were put under the administration of industrial ministries to ensure maximum influence on the number and types of highly qualified manpower by the industries that depended for their functioning on large numbers of graduates, while an educational administration proper was built up only later. Today, there is still a double administration, both by industrial ministries and by the Ministry of middle and higher education for the special institutes at the level of the republics of the Soviet Union and at the all-union level; only some thirty of the largest universities are governed directly by the last-named ministry at the all-union level.

Given the federal structures in the FRG, education in general and higher education in particular are the affair of each of the states. In some of the Länder (states) special ministries for higher education have been created in the wake of the expansion of tertiary education, but in all of them it is one administration responsible for this sector of the educational system, whatever influence may come from other administrative and political quarters to shape its budget or its general quantitative and qualitative aims. On the other hand, this one administration exists eleven times. Centralized authority over education in general and higher education in particular exists only to the extent admitted by the states. So, the Federal Ministry for Education and Science has weak authority only and can exert influence only to the extent that it can finance special initiatives in higher education and co-finance investments in buildings and equipment.

Compared to the Soviet Union the single university in the FRG has more autonomy in the management of its daily affairs, though much less than before the middle of the sixties. There are some signs that single establishments in the Soviet Union may gain more autonomy, as may be exemplified by the encouragement given them to make agreements on their own with employers regarding students' stages in production or the assignment of future graduates to positions in specific enterprises.

An important difference between higher education in the Soviet Union and in the Federal Republic of Germany lies in their admission requirements: in the Soviet Union the admission system operates by entrance examinations, modified by special quotas for certain groups of youngsters. In the Federal Republic special admissions regulations exist for some fields of study only (medicine, dentistry) whereas in most fields of study graduation from secondary education (gymnasium or its equivalent) opens the door to higher education.

Most instructive for the comparison of the countries' systems of higher education are the nature of their educational planning, the actual amount of planning done, and the political and administrative importance of planning and of single plans.

First, educational planning and with it the planning of higher education date at least from the end of the twenties in the Soviet Union. In the FRG planning for higher education on a state or nation-wide basis started only in the mid-fifties.

Second, planning covers every aspect of higher education identified as important in the Soviet Union; it is comprehensive planning in this sense. In the Federal Republic of Germany educational planning is selective, if not patchy; integrated planning of personnel for higher education is virtually nonexistent, for example. Higher education planning can influence admission policies through information only. Further, as there are public and private employers, the latter strictly following their own strategies of investment and employment, even if it were possible to introduce planning norms for higher education on the basis of manpower requirement estimations, parts of the employment sector would not feel responsible for the results of this kind of planning. The situation is quite different in the Soviet Union, even though there are difficulties over the realization of manpower demands stated several years in advance: educational planning in the Soviet Union is integrated with overall economic and cultural planning, whereas in the Federal Republic educational planning is merely integrated with budgetary planning for periods of four years' length; this may be looked upon as the barest minimum of integration.

It does not necessarily follow that the success of educational policies exclusively depends on the amount of planning.

Another difference with respect to educational planning between the two countries is the extent of its centralization. In the Soviet Union a nation-wide planning agency exists that may rely on the assistance of every single establishment of higher education and of every employer who demands highly qualified manpower. What is more, plans have the status of union-wide laws (with built-in clauses of revision). The plans of every republic form part of the general plans. Compared to the Soviet Union the centralization of planning seems to be rudimentary at best in the Federal Republic of Germany. This situation derives directly from the cultural autonomy of each of the 11 states of the Federation. Planning for higher education is centralized only in so far as it may be linked to the Federal budget via the recommendations of the Science Council (Wissenschaftstrat).

(b) Developments in the two systems of higher education

Both systems of higher education have expanded enormously. During the period from 1955 to 1980 the number of admissions more than trebled in the Federal Republic of Germany, and in the Soviet Union, where the post-war expansion began about ten years earlier, this number still grew about 2.3 times. Compared directly, the number of admissions is still 8.0 times higher in the Soviet Union than in the Federal Republic (it was 11.5 times higher in 1955).

The number of students rose even higher than the number of admissions. In 1960 the number of students in the Soviet Union was 8 times higher than in the Federal Republic of Germany; this ratio has decreased to 5:1.

Looking at the development of student numbers in different fields of study, there are three 'waves' discernible for the Soviet Union. First, there was a marked expansion of teacher training, both in absolute and in relative terms; in 1950 nearly 40% of the students were in teacher training. While still growing in absolute terms, the relative importance of teacher training has been reduced to less than half of the former percentage (17.6). Second, while teacher training declined, relatively, engineering grew tremendously, from 26.0% in 1950 to 45.7 in 1965, and this percentage was maintained for the next fifteen years, up to 1980. Third, the most rapid growth of student numbers is in economics, its percentage having risen from 5.8% in 1950 to more than 12%.

In the Federal Republic of Germany the most important fields of study relate to teacher training; its share of students rose to more than 40% in the beginning of the seventies, and in 1980 its share was still 32%. Engineering has never gained the same importance as in the Soviet Union.

With the rapid growth of student numbers staff expanded too. This is a continuing process in the USSR; in the FRG, on the contrary, this growth in the employment of (scientific) personnel has come more or less to a stop, as can be shown by the deterioration of the student/teacher-ratio.

There are still systematic restrictions in access to higher education in both countries, but these seem to be more drastic in the FRG than in the USSR. In the latter, women take more than half of the places in higher education, and they spread much more evenly over all fields of study than in the former, where the share of women barely reaches 40% now. Regional disparities exist in both countries, as do disparities by social origin of the students, but they seem to be less marked in the Soviet Union and several means are employed to reduce these disparities. This cannot be said any longer for the Federal Republic.

Changes in the curricula and the introduction of entire new disciplines, such as electronics for example, have occurred in both systems of higher education.

Curricular changes in the Soviet Union have taken place on two dimensions: first, specialization in the fields of study has been reduced more and more; the specialist with a "large profile" has won out over the specialist with a "narrow profile" as the ideal type of graduate. Second, the curricula have become more research-oriented.

In the Federal Republic of Germany curricula have become more closely oriented to employers' demands. With the rapid expansion of student numbers the relations of teaching to research and the research-orientation of studies have been rather weakened than strengthened.

So, in some of their features, curricula and the reality of teaching in the Soviet Union may have come closer to the situation of higher education in the Federal Republic of Germany, and vice versa.

(c) Developments in the relations between higher education and employment

The number of graduates underwent a development similar to that in the number of admissions and the number of students. In the Soviet Union the total number of graduates in the year 1980 was 2.4 times higher than in 1960 (FRG : 2.5 times). In 1960 the output of graduates in the USSR had been more than 7 times higher than in the FRG; this had hardly changed in 1980 (6.7 times higher). Compared to the development of the difference in the number of students between the two countries, this ratio signifies a relative inefficiency of the system of higher education in the FRG, i.e. a persisting difference in length of study compared to the Soviet Union; this is all the more remarkable when one considers that beginners in the FRG are older by at least one year when they take up their studies. Of course, it is the end-product that counts as well, not only its production time, but this difference has to be pointed out, nevertheless, the more so as an increased length of studies does not automatically produce more thoroughly educated graduates.

What is true for the total number of graduates holds for the development of graduate numbers in different fields of study as well: while the relative number of graduates from teacher training decreased by more than half between 1950 and 1980 in the Soviet Union, the share of graduates from engineering nearly doubled within the same period and the share of graduates from economics more than doubled (2.4).

In the Federal Republic of Germany developments in graduate numbers are less clear-cut, as individual interests and reactions to labour market situations have a greater influence on the choice of fields of study. Most fields of study show cyclical or irregular patterns of development in their share of graduates. One development is outstanding: the rise and fall of the share of teacher training. Further, it has to be noted that engineering has a share of graduates less than half as large as in the Soviet Union.

The distribution of graduates over the different sectors of employment in the two countries shows two common traits: first, this distribution is very uneven; second, the share of the system of education in both the USSR and the FRG is over 40 per cent. Education apart, the distribution of graduates varies impressively, especially in agriculture and forestry, and in construction, where, in relative terms as well, many more graduates are working in the Soviet Union than in the Federal Republic of Germany. By contrast, there are more graduates employed in the health system and in other branches of general services, both public and private, in the FRG than in the USSR.

The growth of the number of graduates each year has influenced the composition of both countries' labour force considerably: within twenty years (1960 to 1980) the number of graduates doubled in the Federal Republic of Germany, and growth has been even greater in the Soviet Union (2.6 times). At present (1983) about every eighth person employed in the Soviet Union is a graduate from higher education; in the Federal Republic it is every eleventh person.

At first glance, it is difficult to understand why the Soviet Union should have a higher proportion of graduates in the labour force than the Federal Republic of Germany. According to widespread beliefs about the influence of the sectorial structure of employment (agriculture etc.; industrial production; services) on the proportion of graduates, the relative number of graduates should be smaller in the Soviet Union, since the percentage of the labour force working in agriculture, forestry and the like (primary sector) is three times higher in the Soviet Union than in the Federal Republic.

If one does not want to accept the hypothesis that graduates' manpower is utilized less efficiently in the Soviet Union, the solution to the riddle may lie in differences between nationally differing systems of organizational operations, i.e. in the established division of labour, which requires a higher number of graduates to ensure close co-operation between the political and economic administrations so characteristic for the Soviet Union. As far as one can ascertain, this latter hypothesis seems to be corroborated.

In relation to formulated demand, both countries seem now to have an over-supply of graduates. First signs of saturation of demand in the USSR can be seen in the seventies, as is true for the FRG. It is the problems of adequate utilization of highly qualified manpower, and of unemployment (FRG) that concern political authorities, planners, and researchers now, and will do so in the years to come.

Problems of misallocation of graduates and of the adequacy of employment stand in the foreground of the debates in the Soviet Union. It is mostly vertical substitution that is deplored; i.e. the employment of graduates in positions where other types of occupational training would be sufficient and/or better adapted to the respective tasks, while problems of horizontal substitution do not seem to be of major importance. It is interesting to note that in the midst of plenty there still is a lack of teachers in the countryside, so that persons lacking the formal qualification of a teacher have to be employed on a large scale, owing to the movement of teachers to the towns, where they can find more attractive employment. Several reasons are given for the inadequate employment of a proportion of graduates (which, by the way, is almost unanimously condemned in the Soviet Union):

First, unforseeable consequences of technical and organizational developments make detailed manpower estimates several years in advance a hazard. Second, categories that help describe jobs and requirements of tasks are outdated, so classifications are unreliable. Third, as young graduates are flexibly qualified and have to be paid less than qualified workers, there exists a definite interest on the part of employers to get as many graduates as may formally be justified regardless of possible massive dissatisfaction on the part of the graduates themselves. Fourth, planning targets may be too specific, compared to the complexity of graduate supply and graduate employment, especially in view of a not very reliable information base.

Inadequate employment is perceived as a problem in the Federal Republic of Germany, too. However, it does not have the importance given to it in the Soviet Union. Furthermore, inadequate employment as a label for all unusual employment of graduates is criticized. A serious problem is caused by the increasing unemployment of graduates in the FRG. Up to now total unemployment rates for graduates are still below the general rate of unemployment, but the number of graduates without employment is rising rapidly. Unemployment hits mainly graduates searching for their first job after having left higher education, especially from fields of study such as teacher training, but unemployment of graduates will increasingly affect those coming from other fields of study, as well.

The problem of graduate unemployment will be aggravated by the increasing number of graduates leaving higher education within the decade of the eighties and maybe beyond, while demand for them will be lower than ever for demographic and economic reasons: with the past expansion in graduate employment, the age-pyramid is heavily skewed now and allows for only small numbers of new employment opportunities to compensate for the retirement of older colleagues. Further, as the demographic peak to which the present cohorts of graduates belong has been followed by a demographic "collapse", primary and secondary education may now and in the forseeable future require smaller number of teachers; the future clients of physicians, dentists, and lawyers may dwindle in numbers, too, and may affect employment rates in these fields, as well.

Third, with the economic difficulties and rapid structural changes (that engender vastly increased productivity) public budgets will not allow for any further growth of public services and additional employment of graduates.

These adverse conditions for graduate employment will not be offset by private employers, even if their share in the utilization of highly qualified manpower will grow, because so far the public services have employed about two thirds of all the graduates in the active population of the FRG.

2. Future developments

From the two country reports and from other sources, several future developments of the two systems of higher education and their relations to employment may be pointed out, even if their discussion may be quite speculative on some accounts and overgeneralized:

- the number of admissions, students, and graduates in each of the coming years up to the nineties;

- changes in the curricula;
- relations to employers;
- the role of universities in recurrent education;
- the changes in conceptions of planning.

Further, there are changes in the system of secondary education that are of direct importance for higher education, and these changes should be mentioned before future developments within higher education proper and in its relations with employment are discussed.

(1) The shape of secondary education is an important condition for the individual and social effectiveness of higher education. It also decides quantitative demand for higher education.

We may discern institutional changes, curricular changes, and changes affecting material conditions of demand for complete secondary education in our context.

Institutional changes of secondary education are under way in the Soviet Union[1] in order to reinforce the relationship within various development goals and especially to resolve some new problems in line with the universalization of secondary education that gives the right to compete for entrance into higher education. There are mainly three contradictory effects visible:

- the whole system of education is ultimately geared to higher education; so youth is socialized to school environments and to continuing there as long as possible;
- other types of post-secondary education and work become relatively less attractive, given the socialization effects mentioned, the possibilities of self-development by going on to higher education, the social esteem and the career possibilities bound to intellectual qualifications and intellectual work;
- there are too many losers in the race for entrance to higher education, which may have negative consequences for any further individual interest in learning and for the personal identification with other kinds of qualification and for non-academic occupations.

The means to counteract these effects seems to be the creation of a new type of school, the "occupational-technical middle school"[2] within the system of secondary education. It leads its students toward a vocation and - simultaneously - toward higher education: its certificate allows to compete for entrance into higher education, to be realized right after graduation or after several years of work. This type of school, if expanded further, may indeed effect a diversification of educational and occupational interests and thereby help to overcome the lack of vocationally educated manpower in Soviet industry. It will help, at least, to reduce the number of applicants for higher education of a given age-cohort right after secondary education and so may even out social demand for higher education over a greater length of an individual's career which, by the way would make individual educational interests more amenable to direct influences from the employment system.

---

[1] A new reform of general and vocational education was adopted in the USSR in April 1984.

[2] Glowka, D."Probleme einer Neudefinition der allgemeinen Bildung in der USSR"(Problems of redefinition of general education in the USSR), in: Anweiler, O./Kuebart, F. eds. Bildungssysteme in Osteuropa - Reform oder Krise?(Education systems in Eastern Europe - reform or crisis?), Berlin 1983),

In the Federal Republic of Germany institutional changes in secondary education had already taken place in the seventies. They were undertaken to break the monopoly of the gymnasium as the only channel leading to higher education, and they stand in close relation with the reform of higher education, whereby the Fachhochschulen have been created as the lower tier of higher education. No further changes of this sort are to be expected. On the other hand, curricular changes are being debated in the FRG aimed at making students better adapted for the requirements of higher education. These debates have not resulted, so far, in any legislative initiative, so it is not clear at present what their effects will be. In the Soviet Union curricular changes in secondary education have been introduced with the new type of school.

Changes in the material conditions for continuing secondary education up to the Abitur (right to start higher education) have been introduced recently in the Federal Republic of Germany. The Federation has cut subsidies for needy students, which affects the income situation of their parents. These cuts have been introduced with two aims - apart from the wish to save some money - in view: First, it is hoped that more, and more intelligent youth of a given age-cohort at that, will go into vocational education (apprenticeships) than has been the case in the last fifteen years. This is in a way a goal of prevention in order to prepare for the coming demographic "collapse" that will reach vocational education in the second half of the eighties. Second, it is hoped that the share of young persons entitled to go on to higher education from a given age-cohort will be smaller from the outset, and so help to reduce the number of students in higher education.

(2) In the near future the total number of full-time students will continue to rise in the Soviet Union. This trend will be regulated as in the past by socio-economic and cultural need of the country.

There may be changes in the share of students of different fields of study to account for the special situation in some branches of employment of course, but in general, economic and demographic conditions rather point to a reduction in the rate of expansion of higher education. The problem is to have an equilibrium between the number of graduates and vocationally qualified manpower the number of whom are to increase.

For the Federal Republic of Germany existing forecasts put the number of admissions at its highest point in 1986 (it would then surpass the estimated number for 1983 by 5 per cent), the number of students at its highest in 1989 (it would be 14 per cent higher than in 1983), and the number of graduates at its highest in 1991 (it might surpass the present number of graduates by nearly 50 per cent). Subsequently, the number of admissions and the number of students will soon decrease considerably, while the number of students graduating each year will remain high until the middle of the nineties.[1]

These forecasts are in a sense "optimistic", in that trend analyses may lead to even higher figures.[2] Looking at the foreseeable labour market problems of graduates, though, the forecasts may indeed be "pessimistic". Furthermore, it should be realized that willingness to reach the Abitur may be drastically reduced, at least for youths with a lower social background, once the market for places in vocational education has become more favourable again (given the abolishment of subsidies just mentioned).[3] It may be a rational choice, nevertheless, to opt for more education in such a situation, because the risk of becoming unemployed after apprenticeship may be at least as high as after graduation from higher education; but this hypothesis regarding higher private investment in education in the face of a high uncertainty about future employment may give too much credit to the unconventional wisdom of youth, and of their parents.

(3) Apart from modernization of content there may be other changes in the curricula of higher education in both countries. In the Soviet Union the trend toward broader profiles, at least for undergraduate studies, and the trend toward an incorporation of research may continue. It is possible, though, that curricula will allow for more individualized specializations, oriented toward individual employers' demands, if direct relations between establishments of higher education and enterprises and other employers are intensified and generalized.

In the Federal Republic of Germany commissions for the reform of curricula have been installed since 1976 at the Federal level and in most of the Länder (states). They comprise members of the state administration, of the relevant organized interests (employers' associations and trade unions), and of higher education. Their mandate consists of working out framework curricula for the universities and Fachhochschulen for every discipline in higher education. The effects of this comparatively recent institutional innovation in the construction of curricula may lead to a stronger occupational orientation of university teaching in the end, but this remains an open question so far.

---

[1] See Grund-und Strukturdaten (Basic Data on Education), Ministry of Education and Science 1983/1984, Bonn 1983; p. 114f.

[2] See Teichler, U. "Öffnung der Hochschulen" - auch eine Politik für die 80er Jahre? ("Opening higher education" - a policy for the eighties, too?), Bremen 1983; p. 39ff.

[3] Buttgereit, M. 1983 op. cit; p. 229ff.

Below this standardization further specialization may occur at the request of special interests, as can be seen in some cases, where Fachhochschulen run special programmes for large chemical firms who delegate some of their personnel to full-time courses. Over and above this, as universities and Fachhochschulen begin to prepare themselves for the more difficult situation in the nineties they have developed special curricula, filling up "curricular niches", so to speak, to cater for special, partly regional, labour markets.

(4) As already mentioned, some establishments of higher education in the Soviet Union have been encouraged to reach bilateral agreements with some enterprises in their regions on the number and qualificatory profile of graduates, of the content and organization of student's internships programmes in these enterprises, etc. As these agreements have proved successful, in that the quantitative and qualitative demands of employers could be fulfilled more exactly than before, general regulations to this end may follow.

In this way, employers will be made responsible for their requirements estimates, though this process will be facilitated by their possibilities of influencing the qualifying process of "their" students. Looking at past and present problems of matching the demand and supply of highly qualified manpower, the generalization of this regulation could mean a breakthrough for politics of higher education in the Soviet Union. Coupled with diminishing overall numbers of students and graduates and with the possible effects of changes in secondary education mentioned above, it may result, in the long run, in types of organizational division of labour somewhat different from these now reported on. (see Section III).

In the Federal Republic of Germany tendencies toward an "internalization" of higher education into the realm of employers' decision-making and control may be noted, too: public administration acquired its own Fachhochschulen in the seventies, and the armed forces possess two universities. Looking at the links of private employers with higher education, several Fachhochschulen co-operate closely with big industrial firms in teaching some of the latter's personnel in full-time courses. There is also the more indirect influence of employers through curriculum commissions, as mentioned already.

In the natural sciences and in engineering there has always been a close co-operation between university institutes and single firms. There now exist plans to encourage even closer cooperation between research personnel in higher education (mainly in basic research), public research institutes and private enterprises to foster industrial utilization of research results with a shorter lapse of time than has hitherto been possible between basic discoveries and inventions and their conversion into saleable products.

(5) There are large differences, so far, in the involvement of higher education in recurrent education between the two countries. In the Soviet Union institutions of higher education are heavily involved, and have to maintain special faculties for retraining, supplementary instruction of managerial personnel, and specialists' improvement of qualifications in general, as we are informed by the original volume of the USSR report.

For universities and Fachhochschulen in the Federal Republic of Germany the function of further or recurrent education is quite new and realized only to a small extent. This function will grow in importance, though, in the coming years, because universities and Fachhochschulen cannot evade the demand for complex recurrent education of highly qualified specialists (but also of persons who have not so far had any higher education) since they are in the unique position, compared to other suppliers of recurrent education of programmes (viz. semi-public organizations such as the Association of German Engineers, for example, or special private firms, and the big firms themselves) that they can organize interdisciplinary programmes quite easily, and can organize longer courses much more cheaply than any other organization. Looking at the future, Fachhochschulen and universities are already preparing for the lean times when they will have to compete for students and will have to fill up gaps to maintain their teaching capacities, and in some cases their very existence.

The large-scale introduction of recurrent education will lead to further diversification of programmes in the system of higher education of the FRG.

(6) With respect to planning, important organizational and technical innovations may be under way, though it is very uncertain whether they will really materialize, and to what extent, because planning conceptions and techniques are closely bound to general political and administrative strategies.

If, for example relations between higher education institutions and industrial enterprises in the Soviet Union will change as suggested in (4), this might lead to another type of educational and manpower planning in that the central planning agencies would deal with framework planning, setting "corridors" for expenditures and student and graduate numbers only, and leaving regional planning authorities as the operative planners who would be in close contact with employers and higher education establishments within their realm. This structure could be assisted by central planning authorities with special research and normative as well as material implementation facilities for questions of curricula, task description and the drawing-up of unified nomenclatures.

It is quite impossible though, to estimate the readiness on the part of planners in the Soviet Union to adopt far-reaching changes in this planning process. On the other hand, the complexity of planning has grown with the comparatively new situation of a rich supply of graduates and an ever diversified and less predictable demand for highly qualified manpower in global terms. This situation will spur the search for better-adapted methods and, possibly, organizational forms, too. At the same time, insights about what may be planned and what may not in higher education and graduate employment is growing, both on the side of planners and on the side of employers. This may spur a review in favour of improving organization and procedures of educational planning in the Soviet Union.

In the Federal Republic of Germany planning for higher education may become more differentiated as well, taking into consideration more differentiated forecasts that rest on more sophisticated research on future manpower needs of various economic branches. The climate for this kind of forecasts and their utilization for the planning of higher-education curricula and capacities and an eventual re-shuffling of resources will be relatively favourable in the coming years, due to the economic situation in general and to the employment situation of graduates in particular. What may become less popular with planners is the merely quantitative planning as practised until now, because the phase of expansion of higher education has ended.

Conclusions

by R. Avakov, B.C. Sanyal and U. Teichler

CONTENTS

1. Past developments and recent issues 329

2. Current higher education and employment policies 331

3. Changing planning concepts 334

4. Some final remarks 337

CONCLUSIONS

This volume provides an opportunity to compare long-term developments of higher education and its relationship with the world of work, as well as recent issues of graduate employment and the implications for higher education planning and policy in the USSR and the Federal Republic of Germany. The papers deal with the historical past of higher education and the present-day structure, methods and content of instruction, organization and modes of research, the effect of technological economic and societal conditions on the development of higher education as well as the approach to higher education planning. This comparison of preconditions, developments and policies might offer a broader spectrum of potential trends and solutions than is usually available.

The analysis reveals striking parallels in recent issues and policy debates in the two countries - especially relating to a re-orientation of higher education policy and planning. Both countries have experienced a substantial change in the preconditions of higher education policy and planning. Whereas past efforts were primarily aimed at overcoming shortages of qualified manpower, the present debate focusses on the changing relationships between higher education and employment under conditions of an oversupply of graduates. Also, reconsideration of planning approaches takes place in this context; models assuming close relations between types of education and occupations tend to be substituted by more flexibility-oriented models.

1. Past developments and recent issues

The papers provide an overview on higher education and employment during the post-revolutionary period in the case of the USSR and during the past three decades in the case of the Federal Republic of Germany.

In the USSR, higher education was geared towards industrial progress and transformation of the economy and society as a whole. Planning of both education and manpower played an important rôle;

a graduate was primarily perceived as a specialist for a certain field and most institutions of higher education specialized in specific subject areas. Important measures for shaping education after World War II were:

- an increase in the share of students in part-time or evening courses from 34 per cent in 1950 to 59 per cent in 1965, and then a decrease to 43 per cent in 1980;
- a restructuration of secondary education aiming to postpone vocational specialization to later stages of educational careers;
- major expansion in certain fields of study, first in teacher training, followed by engineering, and economics.

In the Federal Republic of Germany, for many years there was more or less a consensus that the basic features of the higher education system, strongly shaped by the Humboldtian concept, ought to be preserved. However, the following policy measures could be observed:

- to systematically extend the higher education system and thereby strengthen its research capacities through a reshaping of the personnel structure during the sixties,
- a far-reaching reform of the structure of the higher education system, (teaching and learning as well as the decision-making structure within institutions of higher education) from the later sixties to the late seventies.

Both countries, however, experience similar debates and developments. Technological innovation was for a long time one of the main arguments in favour of educational expansion; there were debates on policies for balancing individual demand, equality of opportunity, and manpower requirements. Although having different systems of higher education, it is interesting to note that growth in the number of graduates from 1950 to 1980 was almost the same in both countries: an increase of 365 per cent of the 1950 figure in the USSR and 385 per cent in the Federal Republic of Germany.

In the two countries, recent issues of higher education indicate a basic change in the relationship between higher education and employment. For a long time, the assumption prevailed that the supply of graduates was insufficient in number and quality to cope with the rising demand of the employment system. Recently, however, the thinking is that the supply of graduates has surpassed the manpower demand in many fields. In spite of differences according to field, occupation, the views of various experts and politicians, etc. a general transformation from a shortage towards a presumed high supply condition in urban areas seems to be an important topic for current debate in both countries. On the other hand, planning faces the difficulty of forecasting some new types of skills resulting from the rapid scientific and technological development.

This change of mood already became apparent in the Federal Republic of Germany in the early and mid-seventies. It would be misleading to state that at certain periods a consensus existed regarding the demand for expansion of higher education; however, the dominant mood from about the mid-sixties until about 1972 favoured a substantial expansion of higher education, whereas since about 1972/73 there has been growing concern about the high public expenditures on higher education as well as about problems of graduate employment.

In the USSR, this change of thought occurred somewhat later. In fact, the IIEP study is one of the major reports published in a foreign language in which higher education experts of the USSR point at this changing situation and its implications for higher education. Obviously, this is still under discussion in the USSR, and concepts on how to deal with it are as yet in the preliminary stages.

2. Current higher education and employment policies

In coping with the changing relationship between higher education and employment at a time of high supply of graduates, neither the USSR nor the Federal Republic of Germany chooses to rely either on an "extreme" model for adjusting higher education to presumed manpower requirements, or on the strengthening market mechanisms which support a corresponding adjustment. Also, the two countries do not seem to look towards a single dominant approach to shape the higher education-employment links, but rather prefer a mixed policy.

Leaving aside for a moment the details of methods as well as the weight of respective measures, it might be said that both countries tend to rely concurrently on six major approaches in their efforts to deal with current discrepancies between supply of graduates and jobs available:

- access and admissions policies aimed at keeping within limits either the total number of students or the number of students in certain fields of study;
- policies regarding the structure of institutions of higher education or of programmes of courses, for example extending short and vocationally-oriented courses;
- curricular policies aiming to overcome the traditional gap between quantitative and qualitative measures;
- promoting links between higher education and its environment, for example by establishing specific agencies for this purpose or by decentralizing planning;
- absorption policies which ease the transition of graduates to employment and their insertion in the labour force without introducing major changes in the structure of employment and the notion of utilization of skills provided;

- active higher education and employment policies which take the current imbalances between supply of graduates and demand for "corresponding" jobs as a opportunity to transform job tasks of graduates, work rôles and the contribution of graduates to the society in the long run.

In addition, in the USSR an effort is being made to improve upon the global planning process in relating the supply of higher education with the demand for manpower.

There are not necessarily clear-cut boundaries between the above-mentioned directions. Also, it is not easy in many cases to make a distinction between efforts to restrict or "neutralize" a high supply of graduates on the one hand, or on the other, to consider it as an opportunity for positive change towards enlightened use of the large supply of graduates.

In the Federal Republic of Germany, it is considered a Constitutional right for any qualified leaver of higher streams of secondary education to be entitled to enrol at an institution of higher education. On the other hand, the policy of "opening up higher education" was chosen in 1976/77 in the face of the demographic "bulge", because restrictions on access to higher education would have led under such conditions to a lack of training opportunities for the rising number of youth. However, restricted admission to some fields of study does exist. In addition, efforts grew to discourage the increase in enrolment for example by changing the scholarship system from allocation of grants to loans.

Debates continue in the Federal Republic of Germany regarding the restructuring of institutions of higher education, course of study and curriculum reform. Most proposals aim at an overall reform of the whole system and will probably not be successful, if the ambitious goals are taken as a yardstick. There are, however, numerous indicators which show that (under the umbrella of these debates regarding the reform of the whole system) changes do take place on a smaller scale. There is a growing diversity of institutions and curricula, moderate if compared to higher education systems such as that of the USA, but considerable when compared to the traditional notion of a more or less homogeneous system.

Absorption policies as well as policies regarding structural and curriculum reforms in higher education in the Federal Republic of Germany were based on a growing concern about graduate employment. The rapid expansion of higher education had led to a relative young highly qualified manpower and thus to low replenishment quotas. The economic problems since 1973 have meant less growth in the demand for qualified manpower in general as well as efforts by government to keep public expenditures down. A mismatch between demand and supply of graduates was strongly felt in the case of teacher training as well as some other fields of study.

Finally, the growing unemployment quota since 1980 has also affected university graduates, although to a lesser extent than for the total labour force. Job opportunities of graduates deteriorated to a much lesser degree than many experts had expected, because adjustments on an incremental basis were much stronger than assumed, and measures had been intensified in recent years to ease the transition of graduates to the employment system. Among others, employment strategies both in the public and in the private sector allow for vertical substitution; initial salaries for recent graduates were reduced in some cases; flexible working-time schemes and other measures are under debate and partially realised.

As far as active higher education and employment policies are concerned, in the Federal Republic of Germany those remain somewhat vague. There are proposals to utilize the growing number of graduates in the framework of strategies for technological innovation, improvement of health and social work services, environmental protection, improvement of housing and living conditions; again, certain of these ideas were implemented on a smaller scale without introducing major strategies. Also, the attempts on the part of graduates to establish new independent means of work and income find considerable political support as individual counter-measures against unemployment. Views supporting such active policies are, however, not the dominant ones; the mood still prevails that a quantitative increase of vocational training would be preferable to a mass higher education system.

In the USSR, the tradition of economic and societal planning in order to stimulate rapid economic growth and transformation of the society also shapes quantitative and qualitative planning of higher education. An admission policy closely in tune with manpower requirements and a curriculum related to the contents of the job tended to be considered appropriate. Current planning of higher education also puts considerable emphasis on the correspondence between admissions policy and manpower requirements. When compared with planning in the past, however, current policies indicate a substantial change in this respect. Amongst other reasons, planning imperfections of the past support policies of a somewhat higher supply. Also, growing individual pressures to increase enrolment in institutions of higher education play a considerable rôle. Finally, the increasing wealth of the society in general as well as improved educational standards necessitate reconsideration of planning goals - from a manpower policy based on the general perception of shortages towards a balance between manpower notions and broader aims of cultural and personal development.

Discrepancies between the supply of graduates and job apportunities do not lead to unemployment in a society in which planning for full employment is part of the overall economic and social policy. However job dissatisfaction of highly qualified persons, complaints about lack of utilization of skills as well as misallocation of skills are considered indicators that a certain degree of "mismatch" exists.

In the case of the USSR, the following proposals have been made to tackle these problems:

- curriculum reform in favour of broader skill profiles in order to permit a more flexible utilization;
- strengthening of higher education and manpower planning on a decentralized level to allow for quicker adjustment processes;
- establishment of councils of young specialists to help counteract some of the reasons for dissatisfaction and to ensure a more adequate utilization of skills;
- improvement of direct links between institutions of higher education and enterprises, for example by not only providing work experience for students, but also by offering opportunities for research linked to the needs of the enterprises;
- establishment of new types of institutions of higher education;
- assigning lower level occupational rôles to university graduates during the first few years of their career;
- early allocation of students to certain enterprises and fixed initial employment for the first few years.

As regards actual higher education and employment policies, as in the Federal Republic of Germany, activities in the USSR cannot be easily interpreted. In general, it is assumed that rapid technological change might lead to increased demand for highly qualified manpower. The increasing number of economics graduates might be seen as the potential to improve the planning and distribution system as well as the services in general. It remained an open question as to what the increased supply of graduates will mean for the division of labour and for new services in the long run.

3. Changing planning concepts

In comparing the development of higher education systems in relation to the employment system, as the contribution by Hüfner emphasizes, one can establish an ideal type model of a continuum between the two extremes of the perfect market system on the one hand and the central planning system on the other. Higher education policy in the USSR was in the past very close to the model of central planning, for it functioned as an integral part of a nationally planned economy. In the Federal Republic of Germany, however, higher education policy is by no means close to the opposite extreme of a perfect market system, but rather of a "mixed" type. A substantial array of planning activities and mechanisms have been established in the area of higher education, but they co-ordinate the federal system only to a certain extent and are embedded in many market mechanisms, especially a predominantly market-controlled employment system. The rôle that planning mechanisms play in the Federal Republic of Germany is underscored - among others - by the fact that the number of manpower requirement forecasts conducted is higher than in other Western European countries.

Higher education planning in the Federal Republic of Germany succeeded in expanding institutions, facilities, personnel etc., more or less in tune with the rising demand for higher education; it contributed to an improved regional dispersion of institutions and substantially helped in achieving compromises of higher educational policies at the various levels and sectors of government. There was discussion however on the rationale of planning: among others, decisions were made that it ought to be primarily "input planning", i.e. serving social demand for higher education, and only take into account manpower requirements as a minor criterion of planning. The conflicting aims of planning did not play a substantial rôle as long as expansion of higher education was responding to social demand, equality of opportunity as well as manpower requirements. But once the expansion was considered to surpass requirements this conflicting goal structure was bound to become manifest. All planning activities in the Federal Republic of Germany indicate a permanent struggle to establish new compromises in the face of conflicting goals.

Many forecasts were conducted in the Federal Republic of Germany on demand and supply of highly qualified manpower. In retrospect, forecasts were reasonably valid as far as global figures were concerned, but not in terms of individual occupations or fields of study. Controversy on the concepts, methods and political implications of forecasts based on the manpower requirement approach led to the view that at least the following improvements of forecasts are needed:

- to systematically take into consideration potential alternative goals of economic, manpower, education and societal policy;
- to make allowance for flexibility in the relationships between level and field of study on the one hand and occupation on the other - both regarding potential substitutions on the employers' side and decisions made by the graduates themselves;
- to closely relate quantitative and qualitative relationships between higher education and employment, for example by considering the impact of curriculum reform on demand-supply relationships;
- to take into consideration absorption potentials as well as the potential impact of active employment policies.

In the USSR, higher education planning could, in principle, rely on the political aim to closely co-ordinate economic, manpower, educational and societal planning. Higher education was thus an integral part of overall planning and was not forced to continuously search for appropriate compromises of goals. It was reinforced by the readiness of the government to take substantial steps towards changing higher education policy once that need was felt.

Nonetheless, in the USSR reconsideration of aims, concepts and methods of higher education was required. Among others, imperfections of forecasts were experienced due to difficulties in predicting technological change and corresponding transformation of job tasks and because of international economic developments affecting national economies. There were also changes in political priorities, for example in the rôle played by private households as consumers or by the balance between manpower requirements and social demand regarding higher education. The schemes for analysing present utilization and future requirements of qualified manpower were considered inappropriate: it became obvious, for example, that the yardsticks of needs and appropriate utilization differed substantially between enterprises or experts' ratings, that bureaucratic attitudes affected claims of manpower requirements and that traditional forecasts and planning methods tended to continue to take misallocations of the past as guidelines for future allocations.

The experience of the USSR spurred a debate during the Workshop on the potentials and drawbacks of higher education planning. It was considered that the failure of forecasts, inaccuracy of information, weaknesses of planning, etc., might unavoidably lead to completely divergent consequences regarding the future rôle of planning. What some experts might take to be clear proof of the systematic drawbacks of planning and therefore call for a strengthening of general educational policies paying less attention to labour market developments or for support of market adjustment, other experts would take as a challenge for more sophisticated models of planning.

The experiences of the past have led to three major changes in higher education planning in the USSR:

- A more sophisticated analysis of the present utilization of qualified manpower and the need for new graduates was considered necessary.
- planning on a national basis is more strongly supplemented by information and adjustment processes on a local basis, for example by various ways of co-operation between institutions of higher education and employing institutions;
- flexible planning became a major aim - not only in terms of making allowance for substitution processes, but also to change curricula in a way that would make it easier to employ graduates in a broader spectrum of occupations.

Although the planning goals, concepts and methods of the two countries under consideration differ substantially, the directions of changes show significant parallels.

4. Some final remarks

Higher education and graduate employment in the USSR and the Federal Republic of Germany show substantial differences, given the traditions and concepts of higher education, the economy and the employment system as well as the rationale and political structure as regards planning. However, the exchange of experiences proved to be useful, because both countries underwent similar directions of changes as well as shifts of paradigms in the analysis of the relationship between higher education and employment:

- from rapid growth of higher education to moderate growth or even stagnation;
- from policies in the face of a shortage of highly qualified manpower to policies under the conditions of market saturation and an oversupply which necessitates completely new ways of utilization of manpower;
- from rigid planning models towards both more flexible methods of planning as well as policies to create more flexible skills.

These changes do not just substitute old policies and planning methods by new ones, but lead to complexity in the relationship between higher education and employment which does not permit simple solutions. Under the circumstances, it is not surprising that the era of simple options in higher education policy has come to an end in both countries making way for concurrent mechanisms of interactions between higher education and employment. This process is frequently viewed negatively because of a loss of clear guidelines, but it could be seen differently: as an opportunity for higher education to contribute to a broader utilization of its outputs in the future.

It is observed that mutual exchange of information and comparative efforts in analysing higher education and graduate employment in countries obviously quite different in their systems and policies might be very useful, thus providing opportunities for reflection on changes and reforms in one's own country.

IIEP publications and documents

More than 450 titles on all aspects of educational planning have been published by the International Institute for Educational Planning. A comprehensive catalogue, giving details of their availability, includes research reports, case studies, seminar documents, training materials, occasional papers and reference books in the following subject categories:

Economics of education, costs and financing

Manpower and employment

Demographic studies

The location of schools and sub-national planning

Administration and management

Curriculum development and evaluation

Educational technology

Primary, secondary and higher education

Vocational and technical education

Non-formal, out-of-school, adult and rural education

Copies of the catalogue may be obtained from the IIEP on request.

The International Institute for Educational Planning

The International Institute for Educational Planning (IIEP) is an international centre for advanced training and research in the field of educational planning. It was established by Unesco in 1963 and is financed by Unesco and by voluntary contributions from individual Member States.

The Institute's aim is to contribute to the development of education throughout the world by expanding both knowledge and the supply of competent professionals in the field of educational planning. In this endeavour the Institute co-operates with interested training and research organizations in Member States. The Governing Board of the IIEP, which approves the Institute's programme and budget, consists of eight elected members and four members designated by the United Nations Organization and certain of its specialized agencies and institutes.

Chairman	Malcolm Adiseshiah (India), Member of Parliament; Chairman, Madras Institute of Development Studies
Designated members	Alfredo Costa-Filho, Director, Latin-American Institute for Economic and Social Planning, Santiago de Chile P.N. Dhar, Assistant Secretary-General for Research and Analysis, United Nations Aklilu Habte, Director, Education Department, International Bank for Reconstruction and Development George Kanawaty, Chief, Training Department, International Labour Office
Elected members	Hellmut Becker (Federal Republic of Germany), Honorary Professor, Free University of Berlin Jean-Claude Eicher (France), Director, Institute for Research in the Economics of Education, University of Dijon Candido Mendes de Almeida (Brazil), Director, President of Foundation Sociedade Brasileira de Instruçao, Rio de Janeiro Georges Ngango (Cameroon), Minister on Special Assignment to the Presidency of the Republic, Yaoundé Mohammad Rasheed (Saudi Arabia), Director-General, Arab Bureau of Education for the Gulf States, Riyadh Sippanondha Ketudat (Thailand), President, National Petroleum Corporation Ltd., Bangkok Jan Szczepanski (Poland), Member of the Polish Academy of Sciences, Warsaw

Inquiries about the Institute should be addressed to:
The Director, IIEP, 7-9, rue Eugène-Delacroix, 75116 Paris

BEST COPY AVAILABLE

The book

This volume reflects the increasing concern in educational planning to relate the world of education more closely with the world of work, based on a critical analysis of the phenomenon in two countries, the USSR and Federal Republic of Germany, that have different socio-economic contexts. How can the educational output be related with the absorptive capacity of the economy? What kind of problems does the planner face in this matching process? How can the problems of utilization of higher education graduates be tackled? To what extent do the different socio-economic contexts make the methods of adjustment different? What are the common elements in the process? These are some of the questions that are discussed in this volume by an international group of researchers.

The authors

R. AVAKOV, staff member of the IIEP responsible for the research project on "Education and Development".

Michel BUTTGEREIT, staff member of the Centre for Research on Higher Education and Work at the Comprehensive University of Kassel.

Bikas C. SANYAL, staff member of the IIEP responsible for the research project on "Higher Education and Employment".

Ulrich TEICHLER, Director of the Centre for Research on Higher Education and Work at the Comprehensive University of Kassel.

ISBN 92-803-1115-8

BEST COPY AVAILABLE